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SEAPORTS AND WATERWAYS MASTER PLAN

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SEAPORTS AND WATERWAYS MASTER PLAN

Prepared By

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the Miami Urban Area Transportation Study
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ABSTRACT:

This is one of five master plan elements which have been prepared as part of a comprehensive transportation master plan. The element is part of the joint federal, state, and county sponsored Miami Urban Area Transportation Study. The master plan examines goals for seaport and waterway development to 1985 and concludes that: (1) Miami has the potential of becoming the foremost cruise passenger port in the nation; 2) port and waterway activity must remain compatible with an unpolluted resort environment and a tourist economy; and 3) Port of Miami cargo activity should complement, not duplicate that at Port Everglades (Broward County). Projections of Port of Miami activity indicate that by 1985 freight tonnage handled through the port will almost triple present levels and passenger volumes will increase to two and one-half times the present level. Alternative port sites are considered, including the possibility of an industrial bulk cargo port in the southern portion of the county. The Waterports and Waterways Master Plan does not recommend development of such a port until its feasibility, necessity and desirability from a community standpoint have been demonstrated. The master plan recommends rehabilitation of the Miami River as an urban waterway through bulkheading, revised land uses on its banks, and a general clean-up effort. Because of uncertainty over the effect upon Biscayne Bay of a bulk cargo port development, dredging and channel construction, the master plan suggests a comprehensive hydrological - biological - ecological study of the bay, with a working hydraulic model.

PREFACE

This is one of five comprehensive transportation master plan reports which have been prepared for Metropolitan Dade County as part of the Miami Urban Area Transportation Study. MUATS is a joint effort of Metropolitan Dade County and the State of Florida in cooperation with the U. S. Department of Transportation's Bureau of Public Roads and the U. S. Department of Housing and Urban Development. The comprehensive transportation study was initiated December 1963 upon approval of a memorandum of agreement between the federal, state and metropolitan governments. The memorandum specified the organization of the study and the division of responsibility between the State of Florida and Metropolitan Dade County. The agreement was in response to the requirements of the 1962 Federal Highway Act for a continuing comprehensive transportation planning process in all urban areas of 50,000 population or over in the United States, based upon the 1960 census.

A work program was prepared in 1964 to meet these requirements and to meet the goals and objectives of the Metropolitan Dade County Board of County Commissioners requring the highest possible level of transportation service to all areas of the county. In the division of responsibility for the program elements, the State of Florida and its consultants had the primary responsibility for preparation of highway transportation facilities while non-highway transportation elements such as mass transit, seaports and waterways, terminal facilities, and airports were the responsibility of Metropolitan Dade County and its consultants.

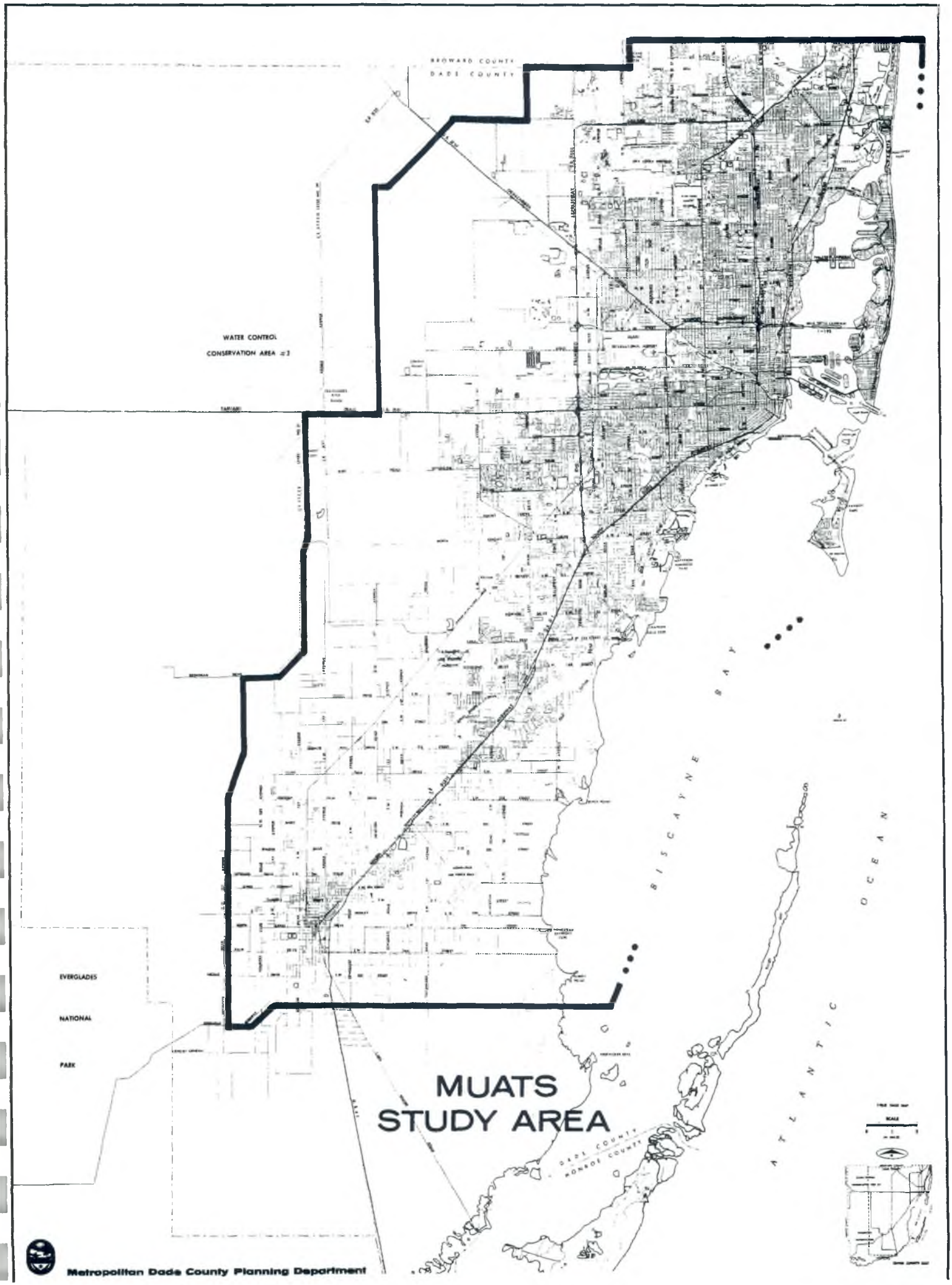
Basic data for the Miami Urban Area Transportation Study, regarding existing travel patterns within the metropolitan area, was collected by the Florida State Road Department through its origin-destination survey in the winter season of 1964-65. The survey gathered facts on the movement of people within the study area by all modes of travel for a typical weekday. Beginning in February 1965, information was gathered by the Metropolitan Dade County Planning Department on population, employment and related socio-economic characteristics. The data was tabulated for the traffic zones delineated for the study. This detailed information became the basic inputs or control factors which provided the basis for planning the comprehensive transportation system because the future travel patterns in Dade County are a function of the manner in which different human activities are distributed.

When these travel patterns and the socio-economic activity were analyzed and compared, projections of future activities such as where people will work, live, shop and play were converted into future travel demands. These demands were then tested against transportation needs and plans were prepared based upon these results. Thus the social and economic conditions in a community determine the need for transportation and form the framework for Metropolitan Dade County's balanced transportation plan. The elements of the comprehensive plan include the following studies: Streets and Highways Master Plan, Public Transit Master Plan, Airports Master Plan, Terminal Facilities Master Plan, and Seaports and Waterways Master Plan.

The purpose of the Seaports and Waterways Master Plan is to present a plan for ports and major waterways in Metropolitan Dade County which will be related to the other master plans in the context of MUATS. The master plan deals with the Port of Miami, the Miami River and other major waterway transportation arteries. No consideration is given to the recreational aspects of waterway development. The Port of Miami has been considered in a metropolitan context as part of the larger Southeast Florida region known as the "Gold Coast," encompassing the counties of Dade, Broward, and Palm Beach. Port activity is analyzed and projected to the year 1985.

Acknowledgment is hereby made to the officials and staff of the Metropolitan Dade County Seaport Department and other county departments and agencies for their valuable assistance in the preparation of this plan and to the Port Everglades Authority of Broward County whose information and statistics also are used therein.

Seaports are considered in this study to be major generators of economic growth and are therefore a significant element of the comprehensive urban transportation plan for Metropolitan Dade County. The comprehensive transportation plan is a functional component of the areawide General Land Use Master Plan of Metropolitan Dade County.


BROWARD COUNTY
DADE COUNTY
WATER CONTROL
CONSERVATION AREA #3
EVERGLADES
NATIONAL
PARK
BISCAYNE BAY
ATLANTIC OCEAN
MUATS
STUDY AREA
DADE COUNTY
MONROE COUNTY
Metropolitan Dade County Planning Department

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SUMMARY

Dade County's coastal location places waterway and seaport activities in a position of economic and aesthetic importance to the area. The pre-eminence of southern Florida as a major port area was established over 100 years ago when Key West, with no land connection to the remainder of the Florida peninsula, was one of the nation's leading ports. Today, Miami is a leading cruise port, second only to New York in the number of passengers arriving and departing. The original settlement of Miami in 1895 was on the southern bank of the Miami River where it empties into Biscayne Bay. Today, the river provides not only a safe harbor for many small pleasure boats, but an easy access to the major waterways of the world for many of Miami's local industries.

Metropolitan Dade County's beautiful water surroundings, while difficult to measure in terms of dollars and cents, are of undeniable economic value. This is one of the few areas in the nation where water-oriented activities are possible throughout the year. This has led to the area's emergence as a major wintertime resort. The beauty of Biscayne Bay, parts of the Miami River with its many small harbors and marinas, and the numerous canals, provide pleasant vistas. The sub-tropical nature of Dade County and its water environment provides a home for some of the most unusual plant and animal life to be found in the United States.

The Seaports and Waterways Master Plan examines both the economic and aesthetic aspects of Dade County's water environment. The recommendations of the Plan are based on growth projections for passengers and cargo up to the year 1985. The needs for additional or expanded port facilities are carefully balanced with the need to preserve and enhance the aesthetic and ecological features of the area. Recommendations are keyed to attaining three general goals basic to the economy, geography, climate and socio-political organization of the Miami urban area and the Gold Coast region. The goals are:

1. maintaining and improving the Port of Miami's position as a major cruise port;

2. ensuring the compatibility of port and waterway development and activity with tourism and the area's natural assets; and

3. defining the role of Dade County's port activities in relation to the future growth of Dade County and to the development trends throughout the Gold Coast economic region.

Based on the goals of the plan, and giving due consideration to demographic and economic projections, the following recommendations are made:

- The Port of Miami at Dodge Island should be developed as the major passenger cruise port of south Florida. Miami has already surpassed New York as the major point of embarkation for pleasure cruises to the Caribbean. With the expansion of cruise facilities at the Port of Miami, which has already begun, more passenger liners will make Miami their home port.

- The Port of Miami at Dodge Island should complement its passenger services with a comparatively clean "roll-on, roll-off" packaged cargo operation. This would widen the economic base of the port and offer an important service to Dade County and the immediate area.

- Serious consideration should be given by Dade County to the feasibility and benefits of developing a new seaport in extreme south Dade. These considerations should include a comprehensive feasibility study that takes into account economic as well as ecological factors related to the operations of the proposed port. While this Master Plan does not contain sufficient detail to constitute such a study, it is recommended that development of a south Dade seaport be based on the following guidelines:

    1. The new port must be compatible with the natural features of Biscayne Bay and with the goals of this plan. Preservation of amenities in Dade County must be recognized as an important overall goal for any water-oriented activities.

    2. The new port must avoid economic competition with the Port of Miami at Dodge Island. The new port must be developed as an integral element of the transportation system serving Dade County.

3. The Miami area is well on its way to becoming the oceanographic academic and research center of the world. Little is actually known about the economic potential of oceanographic industries related to production, harvesting and processing of our ocean's resources. However, it is conceivable that we are on the verge of identifying a new type of industry, the magnitude of which could stagger our imagination. Dade County already enjoys a strategic position in this emerging science, and also has the geographic location to be able to take full advantage of this new science and its potential economic wealth. It may well be that a major new seaport in south Dade can one day be justified for this activity alone. Dade County should be thinking and planning now for the day when this hypothesis proves to be a fact.

The transportation network recommended by MUATS for the south Dade area will be able to efficiently accommodate the additional facilities required for serving a new port if developed in this location.

- An hydraulic model of Biscayne Bay should be constructed with federal assistance to study the hydrological, biological and ecological aspects of the bay.

- The Miami River is one of the most valuable resources of Dade County and one of its most neglected. It is recommended that an active program of water pollution control and redevelopment of areas along the river be initiated. This should include stricter zoning requirements to eliminate dumps and junkyards and the positive control of commercial and industrial land uses along the river front.

- Plans should be prepared to provide public transit service between the Port of Miami and various sections of the metropolitan area. Hydrofoil and hovercraft vehicles should be considered to complement automobile and rapid transit access to the port. However, because of their high initial cost and operating expenses, these new vehicles should be used primarily for recreation and tourist-oriented activities.

- Additional access to the new port should be provided by the construction of an alternate vehicular road. At the present time, only one bridge links Dodge Island with the mainland. As cruise ship activity increases, existing facilities will be overtaxed. Proposals of MUATS include a continuation of the Port Causeway eastward to Fisher Island and a connection to the proposed South Beach Parkway from Miami Beach via a tunnel under the ship channel (see Figure 10).

The review and updating of this plan will be part of the continuing program of review as outlined in the report titled Continuing Transportation Plan for Dade County. Through this process, the needs for seaport and waterway activities will be constantly evaluated, and new plans made or existing ones modified to meet the needs for these facilities as they relate to Dade County's growing population.

INTRODUCTION

The purpose of this report is to explore the possibilities for seaport and waterway development in Metropolitan Dade County. As one of several master plan segments of the larger Miami Urban Area Transportation Study (MUATS), it deals with an area which has seldom been included in other major transportation studies for metropolitan areas. Miami's preeminence in the field of aviation is already recognized nationally. As a major seaport, it is less known. Miami has been slow in getting started as a maritime metropolis in spite of its proximity to major Atlantic and Gulf shipping lanes. In the past, a resort, retirement and entertainment center with virtually no manufacturing or import-export trade had little need for a port facility beyond the provision of marinas and dockage for large and small pleasure craft. This, of course, has not been the case for several decades now, particularly since the Second World War, at the close of which Miami had emerged as vastly more than a winter resort town.

In the earlier development of Florida, its major seaports were Jacksonville, Pensacola and Key West. In the 1840's Key West, with no connection to the mainland, was Florida's most populous and important city, and one of the wealthiest ports, per capita, in the United States. Florida achieved statehood in 1845. Most of Key West's disproportionate wealth during this period is attributed to the salvaging of cargoes from ships wrecked on the reefs bordering the Straits of Florida, a business which has fallen off in this century. Key West held its position of prominence almost until the turn of the century, when it was surpassed by Jacksonville and Pensacola. Tampa did not become a major port and population center until the early decades of this century. Miami did not emerge until after 1930, well into the age of the automobile and at the dawn of aviation expansion. No lower east coast community owes its settlement or growth to existence or potential of a seaport. Fort Lauderdale was able to upstage Miami with the development of Port Everglades in the post World War II era, because of closer location to deep water shipping lanes and the beginnings of a good natural harbor, but primarily because of the inadequacy of Miami's port and obsolete facilities to serve the burgeoning Gold Coast markets.

Miami has had a port, of sorts, since 1896, when the city was incorporated and was the southern terminus of Flagler's railroad. Before that the harbor at the tiny fishing village of Coconut Grove served as the only mail delivery point between Jupiter inlet (at that time the northern boundary of Dade County) and Key West.

The port of approximately 37 acres between Biscayne Boulevard and the Bay, in the northeast corner of Miami's central business district, became more cramped and antiquated throughout its years of use. It consists of three piers and slips providing about 6,000 feet of docking space. The slips have been dredged to 28-30 feet of depth. A jumble of buildings clutters the piers and adjacent area, providing a meagre 398,227 square feet in covered warehouse space, including its 9,848 square feet of refrigerated storage and 37,552 square feet used for office and passenger terminal space. The growing cruise passenger trade has suffered heavily because of lack of adequate facilities in Miami's port. The cumbersome business of collecting baggage and clearing customs has been aggravated by lack of space for parking passengers' automobiles and by the dingy warehouse atmosphere which greeted debarking passengers. The experience of docking at Miami provided a jarring finish to what otherwise was a pleasure cruise. For these reasons, several of the larger and more luxurious vessels have bypassed this port in favor of the more adequate accommodations to be had at Port Everglades, in spite of the latter's poorer location in relation to the metropolitan core area.

There is little point in further enumerating the shortcomings and inadequacies of the old Port of Miami, as its replacement on Dodge Island is already in operation. Proposals for redeveloping or relocating the port had been cropping up since the early 1930's. The major ones considered redevelopment on the existing site or relocation to either the Dodge spoil banks or Virginia Key. A synopsis of all these proposals, and several others is available in Project Report #1; "Seaport Location" published in 1959 by the Metropolitan Dade County Planning Department. This report completely documents the inadequacy of Miami's port to meet needs current even then. The conclusions were:

1. Miami needs its own seaport, relocated to another site.

2. The new port will complement and work with Port Everglades. "Southeast Florida is large enough to justify and support two such mutually complementary developments."

3. A new passenger terminal is needed and will greatly increase local cruise ship business.

4. The port is metropolitan in character and should be taken over and run by the county.

All these conclusions have been acted upon and the major recommendations are on the way to becoming reality. The new seaport, its

plans, capacities and activity will be covered in Section II of this report: "Inventory and Analysis".

As has been hinted, the development of the Port of Miami will be considered in the light of the entire Gold Coast region of Southeast Florida and in relation to the development of other ports within and beyond this region. Relationships between waterborne commerce and travel and other modes of transportation dealt with in other master plans which comprise the comprehensive transportation study for the Miami Urban Area will be explored, as well.

Finally, in keeping with the broader purposes of the MUATS, some limitations will have to be imposed. Projections are being made and plans formulated for all modes of transportation in Dade County to the year 1985. This is a sufficiently long span that allowance will have to be made for some inaccuracies in prognostication and for the inevitable unforseen circumstance. The plans set forth here are a starting point, and it is expected that they will need periodic revision. Since the prime concern of transportation is getting persons or goods from one place to the other with maximum convenience and efficiency and minimum delay, facilities for purely recreational boating on an individual basis are not included for study. While the waters of the bay and ocean, and some of the inland waterways in Dade County have important potential for recreational use, they are not considered "transportation arteries" in this sense.

CHAPTER I

GOALS

The master plan for seaports and waterways in Dade County starts with a definition of goals which the community should identify, and toward which all its plans and actions in regard to ports and waterways should be directed. In attempting to arrive at these overall goals it is helpful to review, as has been done in the introduction to this report, the history and development of port activity in Miami. This review should provide a perspective in assessing the present position of Dade County's port, probable future development trends, and its relation to other South Florida ports. The goals for port and waterway development will be closely related to the general "policies for development" enumerated in Metropolitan Dade County's General Land Use Master Plan, adopted by the Board of County Commissioners in November 1965. These latter are stated in very general language, and obviously any community goals relating specifically to ports and water transportation must be more detailed. They must attempt to express public opinion as to how far port development should go, what sort of development it should be, and how much the community is willing to pay for ports and water transportation, both in terms of actual financial expenditures balanced against increased port revenue and trade, and in the less easily defined terms of inevitable further loss to the natural environment which is generally recognized as the very reason for the existence of this metropolitan area.

There is a basic matter of value judgment which must not be side-stepped by preoccupation with facts and figures, the unquestioned desirability of economic growth for its own sake or short-term profit. This judgment must be made by political leadership coming from the elected representatives acting in the best interest, not only of the Greater Miami community, but in the unique case of south Florida, of the multitude of citizens who do not live or own property here — to say nothing of those as yet unborn. Those entrusted with this leadership must determine what sort of port development, and indeed how much port development is in keeping with the general public welfare and then must resist attempts from all quarters to stray from the goals they have set.

At least three long-range goals for water transportation and port development seem immediately apparent. They are closely interrelated, each one supporting the others; they are basic to the economy, geography, climate and socio-political organization of the Miami area and the Gold Coast region. They are a logical fulfillment of past aspirations and present trends projected forward. They

represent sufficiently broad and noble ideals that few could dispute the ultimate desirability of their achievement; yet are concrete and realistic enough that this achievement is manifestly within the not-too-distant reach of this community. Conversely, the failure to attain these goals, which will presently be outlined, will in the long run indicate failure to realize the destiny of Miami's port and the potential of waterborne transportation.

1. The first of these goals deals with passengers. <u>The Port of Miami should soon become and remain the nation's number one cruise passenger port</u>. At present, Miami is second only to New York in passenger volume, though the potential of this market has hardly been tapped because of the cramped and antiquated facilities of the mainland port. This goal is not beyond reach within a reasonable time after the Port of Miami port is complete. Geographically, it has often been pointed out that Miami is the Gateway to the Americas and the Caribbean. It is this, coupled with the pre-eminence of the tourist industry which has made Miami a leader in passenger trade in spite of inadequate facilities. The port has a built-in advantage over other east coast ports to lure cruise passengers because of the balmy local climate, and it possesses an advantage over other Florida ports by virtue of being attached to a mature, cosmopolitan metropolis already geared to the needs and desires of the pleasure seeking traveler. The greatest concentration of modern resort accommodations in the world is here. Proximity to Bahama, Caribbean and Latin American destinations should enable the Miami port to capture and hold on to the lion's share of foreign passenger trade.

2. The second major goal of this study, closely related to the first, must be to <u>ensure the compatibility of port and waterway development and activity with tourism, the major local industry and employer, and with the natural assets of the locale</u>. These assets include such things as climate, clean air and water, tropical vegetation, the chain of fresh water and marine life which makes possible an abundance of commercial and game fish. beaches, brackish estuaries, and abundant fresh water supply. Port

activity which destroys or adversely affects any of these things is self-defeating, because they are irreplaceable, but also because together they form the reason for the existence of a metropolis which can support a seaport. Stated simply, the economic vitality of Metropolitan Dade County depends in large part on the preservation of an unpolluted Biscayne Bay. The citizens of the Greater Miami community have, on several occasions, voiced their opposition to specific projects which would drastically alter the ecological balance of the Bay. Because of this popular opposition, the county government has abandoned some of these projects and has called repeatedly for a combined hydraulic-biological study of the bay, including a working model, so that all future proposals can be weighed against their potential effect on Biscayne Bay. The U. S. Department of the Interior considers the shores of southern Biscayne Bay and the Dade County Keys of sufficient national significance to designate them for preservation as a national monument. Port development for intense passenger use and "clean" cargo operations is compatible with a policy of non-despoilation of Biscayne Bay. The one enforces the other — a cruise passenger port is best achieved in pleasant, exciting but unspoiled surroundings. A heavy industrial port, on the other hand, with the ever-present dangers of pollution, even that which is accidental, will have to have overwhelming justification in the face of this goal.

As companions to ensuring against bay destruction, several other points should be included in the goal of compatibility between port and tourism and natural environment. These would include:

a. Provision of good public transit links between the port site and downtown Miami, the redevelopment of a vital downtown, and public transit between port and the intensive tourist uses on Miami Beach, including the proposed Interama complex.

b. Insistence on the ultimate in beauty, convenience and efficiency in the design of a passenger terminal, which should be the finest of its kind anywhere in the world.

c. Provision for a continuing port beautification program.

3. A third general goal for the ports and waterways segment of the Miami Urban Area Transportation Study should be to define the role of the Port of Miami, and of any other proposed port facilities in relation to the needs generated by economic activities throughout the South Florida economic region.

CHAPTER II

INVENTORY AND ANALYSIS

This section presents an inventory of waterways, analyzes the Port of Miami in terms of site, buildings, facilities, effect on the economy, and cargo and passenger activity. Projections also are made for 1985.

WATERWAYS

Minor canals, harbors and channels, the Miami River, Intracoastal Waterway, Okeechobee Waterway, and Cross-Florida Barge Canal are described and evaluated.

Minor Canals

Minor canals are constructed primarily for drainage purposes sometimes using existing natural creeks. Fishing and recreational boating, including sightseeing cruises, are considered secondary uses, but are beyond the scope of the transportation study for Metropolitan Dade County. The study is confined to water transportation defined as getting from one place to another in the most efficient fashion, for a definite purpose. Although several of the county's canals are used extensively for pleasure craft in the lower reaches, they are not "navigable" in the stricter sense. The many fixed bridges which carry traffic over them have sufficient clearance for only the smaller boats, and all have, or will have, salinity barriers, not including locks. They are already effectively cut off from the open waters of Biscayne Bay. Such canals, from north to south, are:

Snake Creek Canal
Biscayne Canal
Little River Canal
Coral Gables Waterway
Snapper Creek Canal
Black Creek Canal
Military Canal (Homestead Air Force Base)
North Canal (Homestead)
Florida City Canal

In addition, in extreme South Dade, the Aerojet Canal (C-111) has

been excavated from Aerojet-General's inland Everglades location to Barnes Sound. It may or may not carry barge traffic. The National Audubon Society and others have filed a law-suit and the opening of this canal has been postponed indefinitely. It is feared that further diversion of the Everglades' meager fresh water supply to the ocean, and the resultant salt intrusion will complete the slow destruction of the glades' ecology which has been accelerated with each additional drainage project. Thus far, the "plug" which separates salt and fresh water at U. S. 1 has not been pulled.

Intracoastal Waterway

This 370 mile Florida Waterway, which extends from Key West to Jacksonville, and then on to points north, is under the jurisdiction of the U. S. Army Corps of Engineers.

Twenty-one miles of the Intracoastal is in the St. John's River; with width 125 feet from Jacksonville to Ft. Pierce; depth 10 feet from Ft. Pierce to Government Cut in Miami. The waterway passes through Port Everglades turning basin with a 12 feet deep channel at mean low water. Funds were requested in 1959 to deepen to 12 feet the entire waterway, but the Corps of Engineers determined this economically unjustified.

Principal use of the Intracoastal Waterway is for pleasure craft, although considerable barge traffic exists carrying fuel, gasoline, sand, and stone. Electric generating plants receive fuel barges from Port Everglades, principal port of entry for bulk cargoes such as petroleum, which are barged north to Palm Beach and Ft. Pierce, and south to Miami and Key West. All bridges crossing the waterway provide sufficient horizontal and vertical clearance for water traffic. The majority of the bridges are draw bridges, but a few fixed-span high-arch bridges also cross the waterway.

Table 1 shows freight tonnage on the Jacksonville-to-Miami portion of the Intracoastal Waterway and on the Miami-to-Key West portion, for calendar years 1962 through 1967. Medium average freight traffic for these six years totalled 813,820 short tons Jacksonville-Miami, and 175,206 short tons Miami-Key West.

Okeechobee Waterway

The Okeechobee waterway, connects the Atlantic and the Gulf of Mexico at Fort Myers, via Lake Okeechobee and the Caloosahatchee River. It is 154.6 miles long and 8 feet deep.

Cross-Florida Barge Canal

The Cross-Florida Barge Canal will connect Jacksonville and the St. Johns River with the Gulf at Cedar Key. It will have

TABLE 1
FREIGHT TRAFFIC IN SHORT TONS (1)
FLORIDA INTRACOASTAL
1962 - 1967
(Calendar Years)

Route	1962	1963	1964	1965	1966	1967
Jacksonville to Miami	612,904	692,107	591,977	867,496	1,151,797	966,638
Miami to Key West	148,780	119,309	103,646	79,091	80,322	440,089

(1) Short tons equal 2000 pounds; long tons equal 2240 pounds.

Source: Corps of Engineers, U. S. Army

little effect on South Florida ports. The purpose of the canal is to connect Gulf ports with the eastern seaboard and to eliminate the extra mileage around the Florida peninsula by by-passing South Florida entirely.

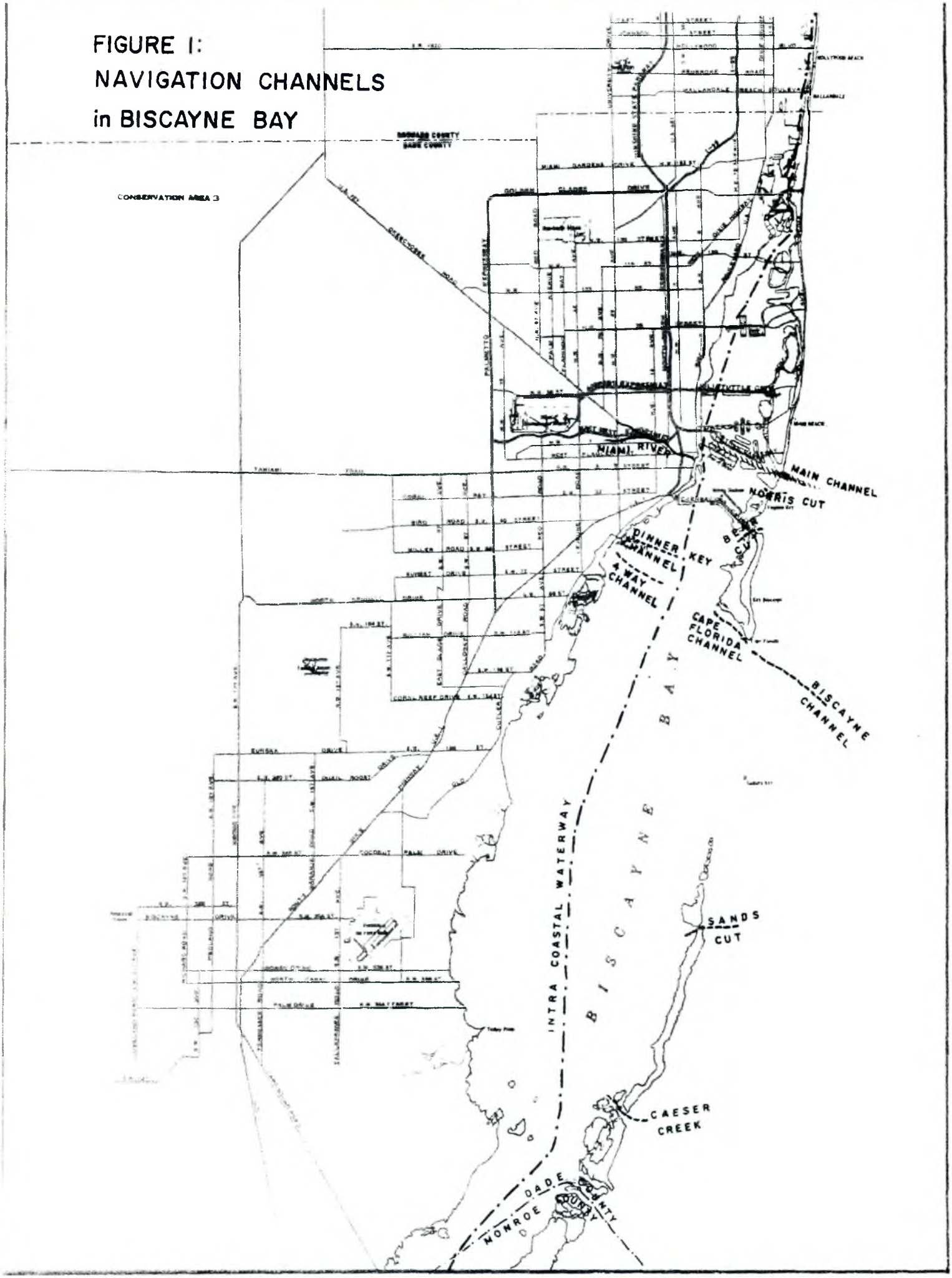
The Canal will have very little effect upon Miami's port because it is principally for hauling bulk cargoes, which this port handles in only minimal amounts. However, the Canal probably would increase traffic on the Intracoastal Waterway if the Ft. Pierce to Miami portion were deepened and improved, because bulk cargoes from the Gulf ports could cross the state and come south on the Intracoastal waterway to Port Everglades (lesser amounts to Miami) instead of around Key West and the end of the peninsula. Northbound freight out of the Port of Miami would likewise increase with the aforementioned deepening of the Intracoastal Waterway, regardless of the Cross-Florida Barge Canal.

Biscayne Bay Harbors and Channels

The main ship channel of Miami's harbor extends five miles from the ocean off the southern tip of Miami Beach to the eastern end of Dodge Island, and another mile to the turning basin and old port site. Average dredged depth is 30 feet. Because the bay is shallow, all waterborne traffic must follow channel routes. (See Figure 1). A shallow channel connects the mouth of the Miami River with the main ship channel, running south of Dodge and Lummus Islands, and north of Fisher Island, called Fisherman's Channel. Other shallow channels connect the dredged mouth of the river with the southern leg of the Intracoastal Waterway, running west of Burlingame Island, and the city yacht basin at Bayfront Park to the main channel. These can accommodate only fishing and smaller pleasure boats. A channel has been dredged across south Biscayne Bay for fuel barges serving the Florida Power and Light Company's Turkey Point plant.

Harbor and channel improvements will be made so that the new Port of Miami will be deep enough to attract the larger cruise and cargo ships, many of which have been diverted to Port Everglades. A $7.3 million project to deepen the harbor to 38 feet(an operating depth of 36 feet) has been approved and recommended by the county, U.S. Army Corps of Engineers and Congress. The project is now in the preliminary engineering stage, with construction scheduled to begin in 1970. It is expected to be completed near the end of 1971. Digging of the long channel from Government Cut to the turning basin should take at least 18 months. This main channel is to be dredged to the 36 foot depth. In addition it is to be shifted 40 feet to the south to avoid undercutting MacArthur Causeway. (The fill obtained from this dredging will be used for furthur bulkhead back-fill on Virginia Key and Fisher Island, and fill from dredging off the southern shore of Dodge Island is to be used to construct the East-

FIGURE 1:
NAVIGATION CHANNELS
in BISCAYNE BAY



West Expressway.) The channel at the port's eastern end is 300 feet wide, and along the south, 200 feet wide. The main approach channel runs 6,500 feet along the north side of the port, with a 900 foot width to allow even the largest vessels to turn at berthside. Dodge Island is being used to construct the East-West Expressway.) The channel at the port's eastern end is 300 feet wide, and along the south, 200 feet wide. The main approach channel runs 6,500 feet along the north side of the port, with a 900 foot width to allow even the largest vessels to turn at berthsite. Dimensions of the inside turning basin are 1,650 feet by 1,700 feet. Figure 2 shows the area to be dredged in this project. Harbor improvements will be made with $789,000 from the county as local sponsor, and $6.5 million, or 89 percent, from the Federal government.

Miami River-Miami Canal

For most purposes the Miami River is navigable only as far as N. W. 36th Street. Even so, it is one of the busiest and most important of waterways in South Florida. Originally the river had its source in the vicinity of N. W. 27th Avenue. It was a clear stream with rapids where it crossed the limestone coastal ridge. These were blasted out for navigation and drainage purposes, and the Miami Canal was dug connecting Biscayne Bay with Lake Okeechobee, a distance of some 80 miles. Only the last 20 miles are in Dade County, and of this only the 5½ mile portion below the 36th Street dam and salinity barrier is important to waterborne transportation.

A navigation channel has been dredged in the Miami River and is maintained by the U. S. Army Corps of Engineers. From the river mouth to the south fork (see Figure 3) it is 14-16 feet deep and 150 feet wide. The channel continues at this depth with a 125 foot width as far as the Tamiami Canal. Upstream from the Tamiami Canal until the railroad bridge just east of the 36th Street salinity dam the channel has a width of 90 feet and a depth of 10-14 feet. Corps of Engineers regulations require a "clear fairway" for marine traffic of 85 feet from the bay to the Tamiami Canal and 60 feet from that point to the railroad bridge.

Fixed bridges on the lower navigable stretch of the river include only the expressway spans under construction. These have a 75 foot clearance. Lift bridges occur at the following locations:

Brickell Avenue
South Miami Avenue
S. W. Second Avenue
S. W. First Street
West Flagler Street
N. W. Seventh Avenue
N. W. Twelfth Avenue
N. W. Seventeenth Avenue
N. W. Twenty-second Avenue
N. W. Twenty-seventh Avenue

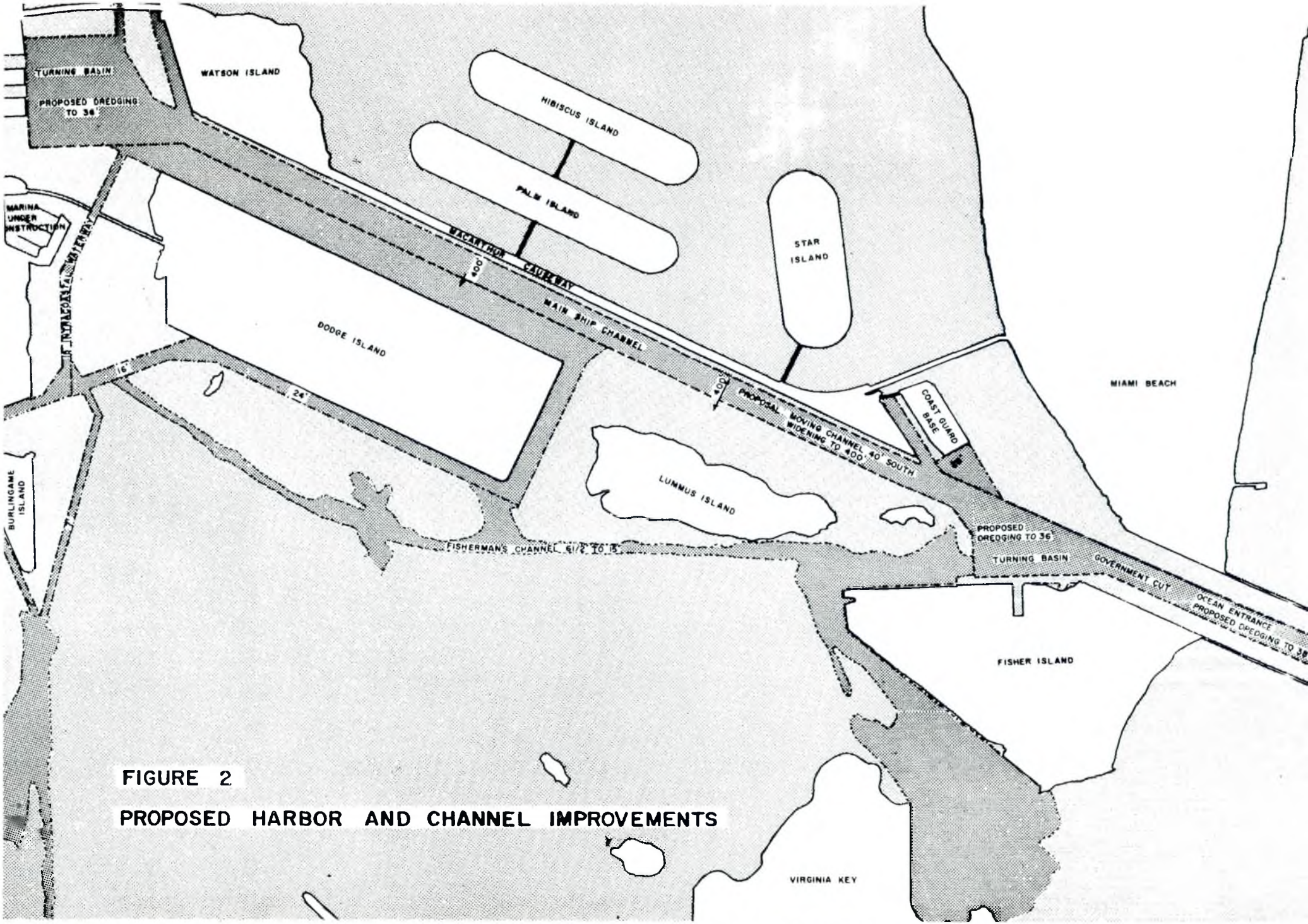


FIGURE 2

PROPOSED HARBOR AND CHANNEL IMPROVEMENTS

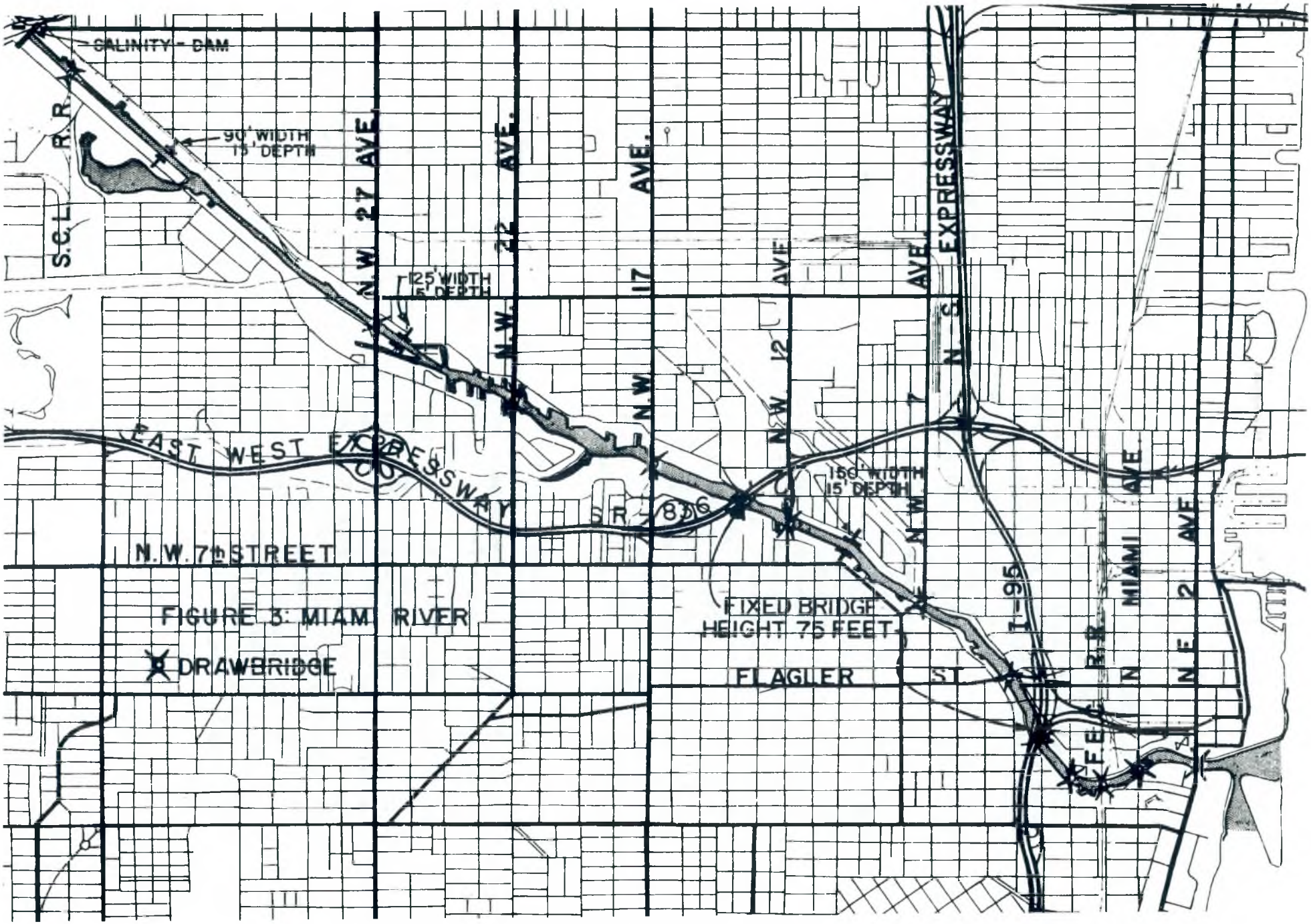


FIGURE 3: MIAM RIVER

These bridges are maintained and operated by the county. All of these create minor conflicts with vehicular and pedestrian movement except in time of hurricane alert when many small private vessels seek the relative shelter of the Miami River to ride out the storms. The situation has been made more tolerable by a waterborne police escort which now organizes these boats into flotillas. Low level fixed-span bridges occur west of the salinity dam in the vicinity of the 36 Street-Airport Expressway interchange at LeJeune Road (N.W. 42 Avenue) Flamingo Way (Hialeah), and Curtiss Parkway (Miami Springs). Of the three railroad bridges crossing the River or canal, the F.E.C. bridge just west of South Miami Avenue is a movable span.

One of the worst bottlenecks is the Brickell Avenue bridge which interrupts traffic flow on U. S. 1. Proposals for a high level bridge or a tunnel under the river at this point both have been heard in recent years. In the case of a high level fixed span bridge, the elevated approaches would have to be so long that considerable lengths of downtown Biscayne Boulevard and of Brickell Avenue would have to be devoted to ramps which would create a "wall" between the central business district and the bay and park. The tunnel proposal, while recognized as possible from an engineering standpoint, and desirable for navigation purposes, would be a costly undertaking. Miami's Downtown Redevelopment plan, prepared by Doxiadis Associates, sidesteps this dilemma by proposing that Biscayne Boulevard be de-emphasized in favor of an elevated span over the F.E.C. tracks and bridge west of Miami Avenue. This would be the major carrier of north-south traffic through downtown and would presumably reroute U. S. 1.

Land uses along the banks of the Miami River include industrial, commercial, institutional, and residential. Hotels, motels, yacht basins, parks and auto parking lots also occur along the shores. The water-oriented industries along the Miami River are most important to this study, because the river is the home base of many operations which support the Port of Miami on Dodge Island. They include shipyards and drydocks, ship chandleries, steamship agents and marine towing firms. The river-based shipyards repair and service not only the major ships using the port, but also numerous pleasure craft from far-away ports which make Miami their winter home. Miami Shipyards and Miami Shipbuilding Corporation can accommodate vessels up to 600 tons, while Merrill Stevens Drydock Company handles vessels up to 500 tons. Others on this waterway are Snyder and DesRocher, Inc., Marine Acoustical Services, Inc., Marine Surplus, Inc., and Sea Terminals, Inc. Marine towing firms located on the river are Atlantic and Gulf Towing, Inc., Howard Backus Towing, Inc., Deep Six Marine Salvage, and DesRocher Towing Company.

Traffic on the Miami River, as well as in Miami Harbor, is recorded by the U. S. Army Corps of Engineers. The most recently published annual tonnage figures available are for the year 1967 (See Table 2). Except for a decline in the year 1964, and again in 1966, tonnage totals handled on the Miami River-Miami Canal remained relatively constant during this period. In the years for which such information is available, tonnage of exports to foreign ports has far exceeded imports handled by the Miami River waterway. Domestic tonnages have likewise far exceeded foreign, with receipts leading shipments in this category.

As far as future tonnages on the Miami River-Miami Canal are concerned, no distinct trend of any significance can be interpolated from these figures. It is plausible to assume that the annual rate of increase should pick up due to the influence of three factors:

1. completion of Port of Miami facilities and operation at capacity;

2. deepening and improvement of the Miami-Fort Pierce segment of the Intracoastal Waterway; and

3. opening of the Florida cross-state Barge Canal.

PORT OF MIAMI

On July 1, 1960, Metropolitan Dade County assumed the responsibility of developing and operating a totally new port for Dade County. Formerly the City of Miami operated port facilities on the bayfront which have been continued on an interim basis and will be gradually phased out as development of the port on Dodge Island progresses. The bayfront port land will be returned to the City for other purposes. Starting with a log pier at the mouth of the Miami River which served the port purposes of a pioneer community since 1840, the port grew by 1915 to 26 acres on the bayfront. Later it encompassed 36 acres. A channel was dredged 100 feet wide and 18 feet deep. The Federal government adopted this as the main channel, and it was further improved to a depth of 30 feet and a width of 400 feet. A turning basin was created with dimensions 1,650 by 1,700 feet.

The Site

The "Dodge Islands" were a chain of four spoil banks created by the dredging of the main ship channel to the old port. They remained vacant for years on the south side of the channel, as did Lummus Island, another spoil bank. Fisher Island, east of Lummus

TABLE 2
MIAMI RIVER FREIGHT TRAFFIC
1962 - 1967
(Calendar Years)

Fiscal Year	Freight in Short Tons (1)
1962	265,219
1963	265,257
1964	236,967
1965	268,455
1966	223,343
1967	252,076

(1) Short tons equal 2000 pounds; long tons equal 2240 pounds.

Source: Corps of Engineers, U. S. Army

Island, serves as a bunkering station for vessels using the port.

The new Port of Miami is an island in Biscayne Bay encompassing 275 acres, or more than twice the area of Miami's central business district. It is 10 times the size of the old port. It runs parallel to the MacArthur Causeway on the south, separated from it by the enlarged main ship channel. It is connected to downtown by a vehicular and railway bascule bridge over the Intracoastal Waterway. Berthing spaces for vessels are parallel to the continuous dock along the northern side of the island instead of being head-in slips as they were at the old mainland port. Vessels can turn and maneuver in the 900-foot wide approach channel at dockside. The port provides 9,200 feet of berthing space for vessels, or roughly one and three-fourths miles. Bulkheads are extended down to a 40 foot depth below the surface at mean low water. Six thousand feet of railroad track are available at dockside, and the port has one mile of train make-up track. The problem of multiple train movements across busy Biscayne Boulevard for sorting and make-up purposes that existed in the original port has been eliminated. This will be accomplished within the port boundaries. Truck loading facilities and open storage for trailers and for non-perishable cargoes has been greatly improved at the new port. Dock aprons are 70 feet wide, and 150 acres is provided for open storage and container operations.

Buildings and Facilities

Structures on the new port site include transit shed space totaling 472,000 square feet. This will be expanded by 25,700 square feet when the new port facilities under construction are completed. Total covered storage is thus 497,500 square feet. Two large transit shed buildings are each 1,000 feet long, with a clear span of 200 feet. These are parallel to the main north wharf. At the eastern end of Dodge Island, two cargo transit sheds, each 36,000 square feet, have been built for the growing Caribbean trade. Adjacent to these are the roll-on, roll-off platforms for loading of trailer-container ships. With these platforms, trailers packed with cargo can be rolled directly into the ship while other trailers or containers are lifted on by crane operations. Simultaneous use of both loading methods makes for quick and efficient handling of cargoes destined weekly for the Caribbean and Central America. A temporary floating platform is moored on the north side of the island adjacent to the passenger terminal. A fourth platform is under construction on the south side of the island and will be completed by February 1969.

West of the large transit sheds, also along the main north wharf, is the area where a new cruise passenger terminal is being built. This terminal is designed to handle up to five ships and 2,500 passengers simultaneously, including baggage. The design is similar to that used at major air terminals for passenger egress and baggage handling. It consists of five major "stations," one for each ship, which will convey passengers to and from the ship in air-conditioned tubes. Each of the five is to have its separate area for parking passengers' automobiles. The design and pattern of flow for passengers and baggage is totally new and its execution should make Miami the most efficient and modern cruise passenger port in existence. Two of the "pods" are now (December 1968) in use and are serving all 5 cruise ships for the 68-69 winter season. The new port was formally dedicated December 29, 1968. The Seaport Department contemplated adding a sixth "pod" and roll-on, roll-off platform on the western end of the island.

A maritime office center occupies the westernmost portion of the port site. This consists of two two-story, air-conditioned buildings which house port administration offices, steamship agents, shipping lines, foreign consulates, and the various government services such as U. S. Customs, Public Health, Agriculture and Fisheries, Florida Development Commission, Board of Conservation, Hydrospace Research, etc. These buildings have been completely landscaped and include parking facilities with space for expansion. Two small telephone and electric equipment buildings and a maintenance building complete "Phase A" of port development. This initial phase includes all facilities now completed or under construction. (See Figure 4)

Space on the southern shore of Dodge Island has been set aside for facilities for Miami's oceanographic research center. Plans are underway to provide space and facilities for berthing and servicing the ships to several oceanographic research agencies at the port, because channel depth at the Virginia Key site is not sufficient to accommodate these vessels. The ships using this area likely will include those from the University of Miami's Institute of Marine Sciences, the Bureau of Commercial Fisheries' Tropical Atlantic Biological Laboratory, and the East Coast Oceanography Laboratory of the Environmental Sciences Services Administration (ESSA).

The Dade County Seaport Department has commissioned a detailed, long-range development plan for the Port of Miami. Such a plan will indicate how long the port facilities under construction or scheduled will be able to serve adequately the needs of the greater Miami community and what expansion will be necessary, and when. The port master plan is being prepared by the consulting firm of Tippetts, Abbett, McCarthy and Stratton, experts in the field of port planning and development. Publication is expected by February of 1969, and when adopted should become a detailed part of Dade County's evolving Master Comprehensive Planning Program.

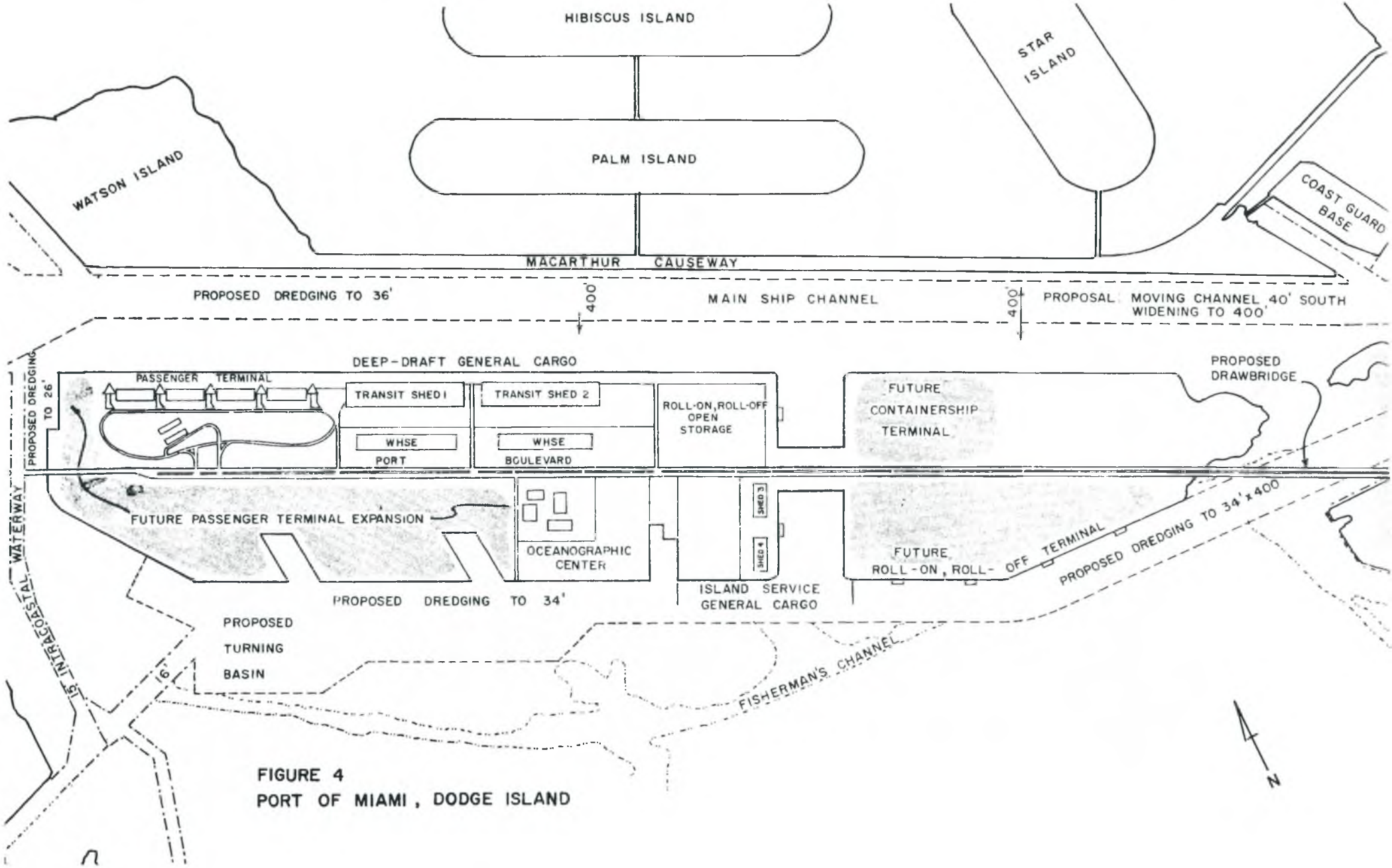


FIGURE 4
PORT OF MIAMI, DODGE ISLAND

Unlike most major ports, the Port of Miami, built on a barren, artificial island, has an ambitious beautification program in keeping with the atmosphere of a tropical resort. Thousands of trees have already been set out, and provision has been made for more plantings. The esthetic aspects of port development have been recognized as important to the port's business, particularly passenger trade.

The facilities and services of the new Port of Miami can be listed as follows:

Location & Area: 275-acre bulkheaded island in Biscayne Bay adjacent to main ship channel and downtown Miami.

Berthing: 9,200 lineal feet (turning at berthsite on 900-foot channel).

Turning Basin: 1,650 ft. by 1,700 ft.

Depth: 30 feet (37 approved)

Dock Aprons: 70 feet

Open Area: 150 acres for open storage, trailers, container operations.

Passenger Terminal: in construction stage, open winter, 1968-69...5 ships and 2700 passengers. 25,700 sq. feet of covered storage.

Transit and Shed Space: 42,000 sq. feet clear span.

Railways: F.E.C. & S.C.L.

Dockside Rail: 6,000 feet Train Make-up: 1 mile

Bulkhead: for 40 foot depth (35 foot operating depth for ships).

Port Services: 52 steamship lines, to 70 nations, 121 ports of call General Cargo and Containerized Shipping; weekly sailings of containerized, roll-on, trailerized cargo to eight countries; freight forwarders; foreign banking firms; Consulates of 31 countries; four crane service firms; eleven motor carriers, including general commodity, refrigerated, and heavy haulers and machinery; five ship chandlers; four shipyard firms; five marine towing firms; one bunkering firm; and 13 departments and services of the U. S. Government.

Sailings from Port of Miami: Daily to Bahamas; Weekly to Caribbean, Central America, North coast of South America, most of Europe; Semi-monthly to remainder of South America, other free world ports.

Capital Improvement Priorities: Metropolitan Dade County has presently under preparation a long-range capital improvement program. Projects of metropolitan scope are proposed for financing and construction in the six-year period, 1968-1974. All projects are based upon the areawide master plan and MUATS. The following items are recommended for inclusion:

- northwest bulkhead. (fiscal 1968-69)
- ESSA ship service center, passenger terminal building completion, channel dredging, south bulkhead, phase A. (all in fiscal 1969-70)
- transit shed no. 5 (fiscal 1970-71)
- fire station and security building, transit shed no. 6, platform D. (all in fiscal 1971-72)
- south bulkhead, phase B, office building no. 3. (both fiscal 1972-73)

This is a tentative long-range schedule, and priorities will be revised annually to reflect actual financial capability and more refined long-range plans for port development. This detailed master development plan for the Port of Miami will establish and develop priorities, costs, and financing plans.

Cargo

Miami's port, as planned, complements rather than competes with the activity of Port Everglades. It must be remembered that the two ports, so close together, serve essentially the same hinterland: the counties of Dade, Broward, Palm Beach, and to a lesser extent, Monroe. Miami's port is located in the most populous portion of this area and enjoys the highest value of waterborne trade, while Port Everglades is situated in the region's geographic center and in the area of most rapid population growth.

Florida exports more volume in cargo than it imports, as does the United States as a whole. However, Southeast Florida relies heavily on imports. Miami is the leading port in south Florida for the entry of agricultural products--meat, vegetables, bananas, sugar, and leads in the export of meat, rice, flour, animal feeds and vegetable oils. During the period 1960 to 1964, freight moving into the port accounted for 93.8% of traffic at Port Everglades, while accounting for 75.3% of traffic at the Port of Miami. In 1967, it was 91.8 for Port Everglades and 55.1 for Miami, showing that Miami's export trade is growing faster than that of Port Everglades. Miami's new port is in a better position to increase its exports because of Dade County's agricultural and manufacturing industries. Petroleum and allied commodities accounted for 82% of total freight handled in the

three-county area (Dade, Broward and Palm Beach) in 1964, but only 46.1% of freight at Miami's port. Since Belcher Oil Company moved from the old port to Fisher Island in 1967, petroleum tonnage is not included in Port of Miami figures.

Among Florida's major ports, Tampa is the leader in freight volume, while Jacksonville leads in value of waterborne trade. Miami ranks only fourth in volume, trailing Port Everglades, which is third; but in value of waterborne commerce, Miami jumps to second statewide, ahead of Port Everglades and Tampa. (See Figures 5 and 6) The Florida Development Commission, in its "Statistical Summary of International Commerce in Florida; 1965" puts it this way:

> "An interesting feature in comparing line graphs representing total volume of waterborne trade and total value of waterborne trade is to trace Miami as sixth in volume (4th in 1967), but third in dollar value (2nd in 1967). This observation is important because the obvious and correct conclusion is that the port handles low-volume, high value products; i.e., machinery, vehicles, etc. The importance is that this type of cargo generates comparatively greater port income. A joint University of Florida and Florida Development Commission Port Study completed in 1963, shows that each ton of cargo moving through the Port of Miami is valued at $436, while 'all ports' run about $40 a ton."

Note that the last study referred to was in 1963, when the Dodge Island facility was not yet in operation. During 1967-68, Miami was second in dollar value of cargo handled among Florida ports. (Figures for both Miami and Port Everglades on volume and value for imports and exports are given in Table 3.) The value of cargos moving through the Port of Miami is proportionally higher than that of ports specializing in bulk cargo.

The growth of the Port of Miami is shown graphically in Tables 4, 5 and 6, covering port records for the fiscal years 1960-61 through 1967-68. Number of ships docking at the port increased from fewer than 1700 in 1960-61 to over 2200 in 1967-68. The year 1965 was a "low year" primarily because that is when port construction and its accompanying disruption of normal service were at a peak. Port revenue has likewise risen steadily from below $700,000 in 1961 to over $1,330,000 in 1968. The category showing the greatest increase has been cargo tonnage moving through the port. This has increased from 492,000 short tons in 1961 to over 808,500 short tons in 1967-68.

TABLE 3

MIAMI AND PORT EVERGLADES, VOLUME AND VALUE OF IMPORTS AND EXPORTS
1951; 1961-1967 (Calendar Years)

FREIGHT VOLUME, FOREIGN AND DOMESTIC, IN MILLIONS OF POUNDS

	IMPORTS		EXPORTS		TOTAL	
Year	Miami	Pt. Everglades	Miami	Pt. Everglades	Miami	Pt. Everglades
1951	653.5	580.2	117.5	334.7	771.0	914.9
1961	618.4	2,339.7	239.1	302.4	857.5	2,642.1
1962	746.7	2,433.4	243.7	182.7	990.4	2,616.1
1963	831.7	1,816.4	311.6	253.6	1,143.3	2,070.0
1964	892.8	2,191.7	373.7	363.3	1,266.5	2,555.0
1965	883.4	3,201.7	456.2	252.4	1,339.6	3,454.1
1966	989.0	3,609.0	571.0	366.0	1,560.0	3,975.0
1967	1,715.0	3,859.0	591.0	507.0	2,306.0	4,366.0

FREIGHT VALUE, FOREIGN AND DOMESTIC, IN MILLIONS OF DOLLARS

	IMPORTS		EXPORTS		TOTAL	
Year	Miami	Pt. Everglades	Miami	Pt. Everglades	Miami	Pt. Everglades
1951	$ 19.7	$ 8.8	$ 23.1	$ 1.2	$ 42.8	$10.0
1961	42.2	36.2	51.4	12.8	93.6	49.0
1962	49.5	38.2	62.0	21.0	111.5	59.2
1963	62.4	39.0	68.9	15.1	131.3	54.1
1964	76.9	43.7	96.8	21.9	173.7	65.6
1965	81.5	55.5	99.1	18.7	180.6	74.2
1966	102.0	60.0	135.0	24.0	237.0	84.0
1967	124.0	59.0	150.0	34.0	274.0	93.0

SOURCE: Florida Development Commission, International Division and U. S. Department of Commerce, Bureau of Census, Foreign Trade Division

TABLE 4
PORT OF MIAMI REVENUES
1960-61 THROUGH 1967-68
(Fiscal Years)

Fiscal Year	Total Revenue
1960-61	$680,000
1961-62	806,396
1962-63	929,762
1963-64	942,739
1964-65	1,049,556
1965-66	1,050,332
1966-67	1,165,244
1967-68	1,329,878

SOURCE: Dade County Seaport Department

TABLE 5
PORT OF MIAMI, NUMBER OF SHIPS-DOCKED,
1960-61 THROUGH 1967-68
(Fiscal Years)

Fiscal Year	Number of Ships
1960-61	1,690
1961-62	1,961
1962-63	2,281
1963-64	2,292
1964-65	2,197
1965-66	2,485
1966-67	2,168
1967-68	2,293

SOURCE: Dade County Seaport Department

TABLE 6
PORT OF MIAMI
TOTAL CARGO TONNAGE
FISCAL YEARS 1960-61 THROUGH 1967-68
IN SHORT TONS

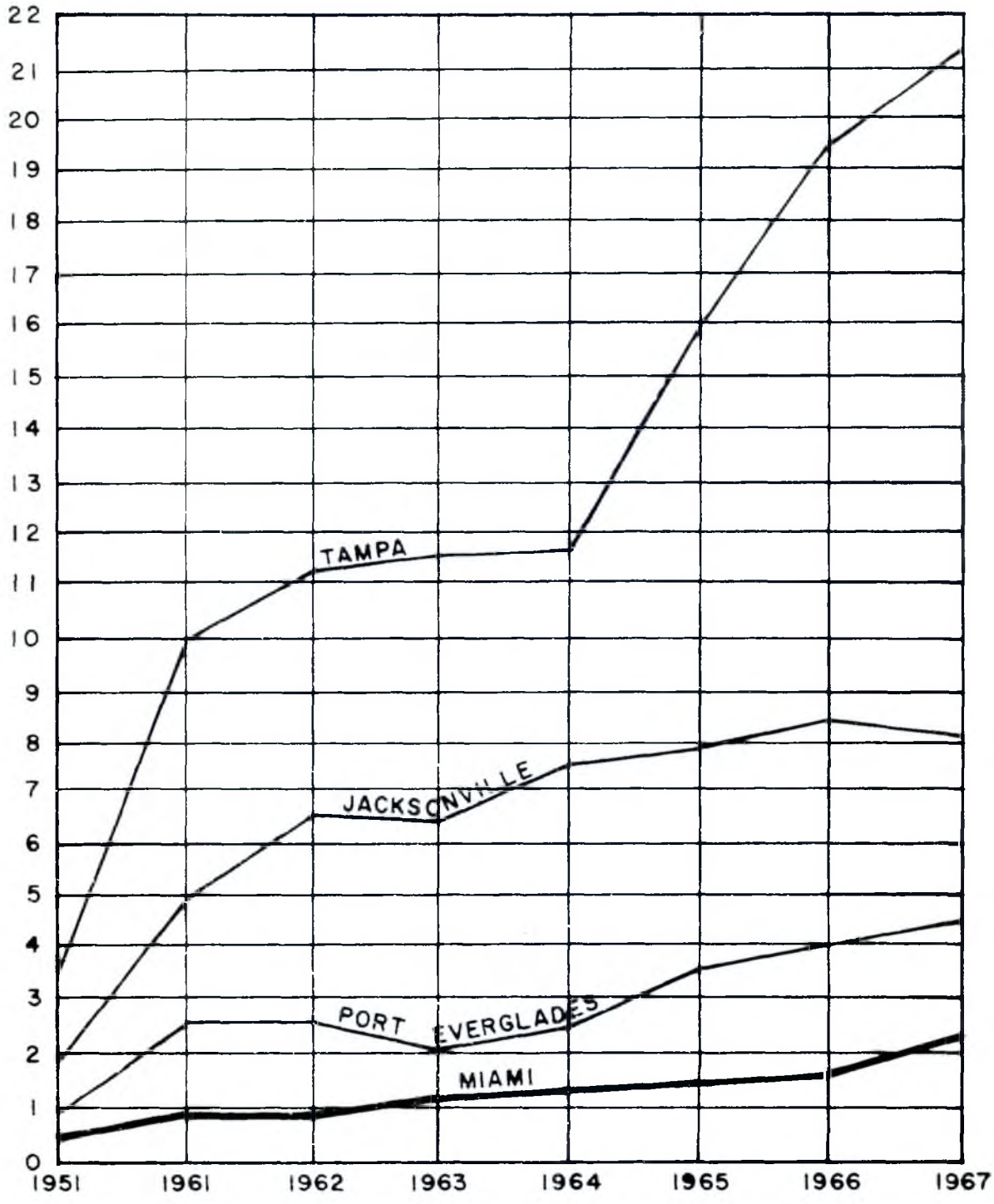
Fiscal Year	Short Tons[1]
1960-61	492,032
1961-62	642,749
1962-63	754,461
1963-64	841,132
1964-65	873,496
1965-66	950,432
1966-67[2]	905,377
1967-68[2]	808,503

(1) Short tons equal 2,000 pounds, long tons equal 2,240 pounds.

(2) Reflects loss of petroleum tonnage moved to Fisher Island.

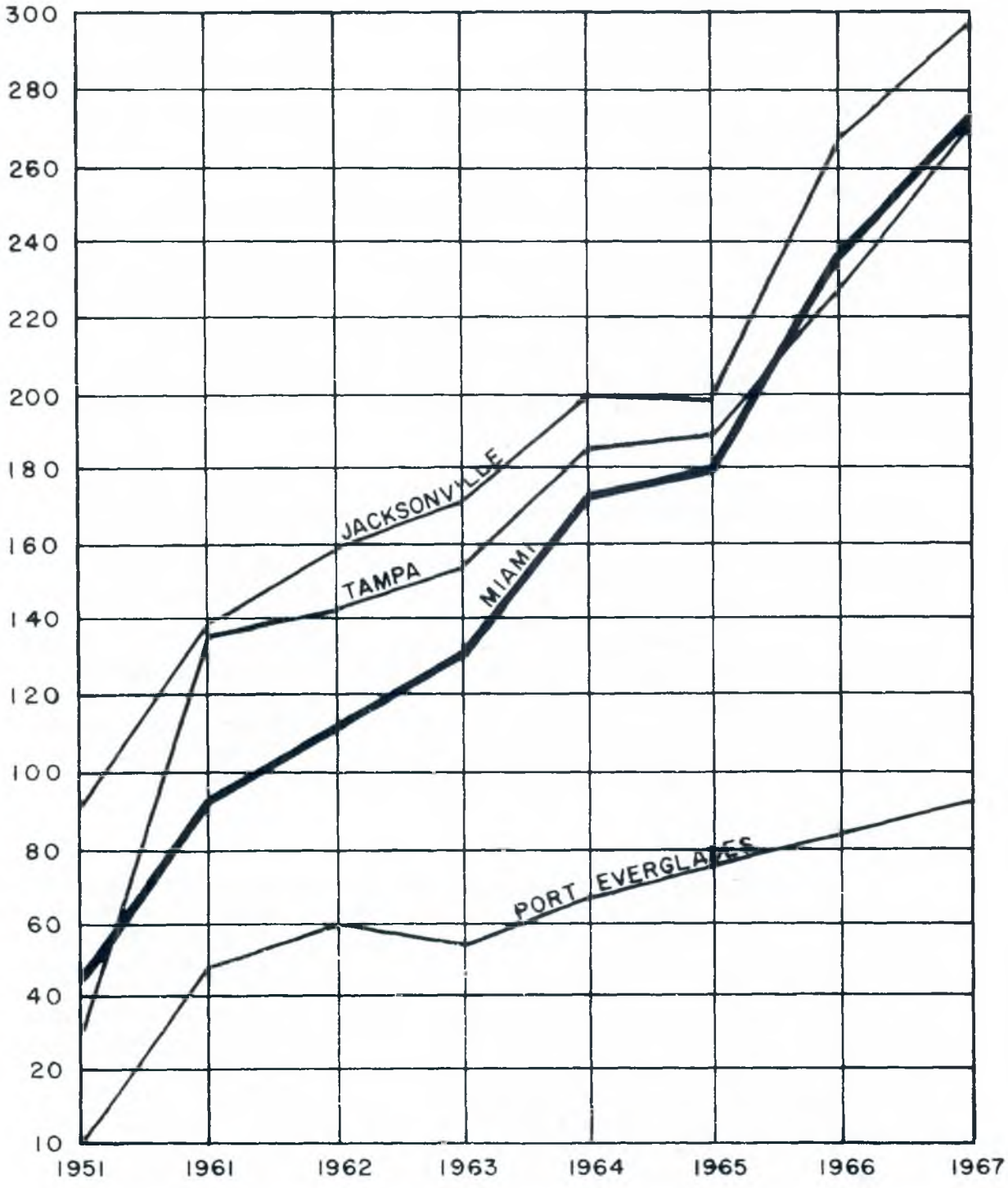
SOURCE: Dade County Seaport Department

FIGURE 5: FREIGHT VOLUME, 4 LARGEST FLORIDA PORTS
(in millions of pounds)
1951 and 1961 - 1967 (calendar years)



SOURCE : FLORIDA DEVELOPMENT COMMISSION AND U.S. DEPT. OF COMMERCE

FIGURE 6: FREIGHT VALUE, 4 LARGEST FLORIDA PORTS
(in millions of dollars)
(1951 and 1961 - 1967 (calendar years)



SOURCE: FLORIDA DEVELOPMENT COMMISSION AND U. S. DEPT. OF COMMERCE

The invention of containerized, roll-on-roll-off cargo handling has been called the greatest advance since the steamship replaced the sailing vessel. The fact that Miami is the gateway to the Caribbean and Latin America by air will help cargo trade with the Latin countries to increase. Miami International Airport's multiple daily jet flights to capitals in the Latin-Caribbean market put sales executives within two to four hours of their customers in the two thriving Common Markets. Miami's port can deliver goods on a short-notice, sustained schedule. Weekly sailings from the Port of Miami to every port in the Caribbean, Central America, and the north coast of South America allow Dade industries to compete with European and Far East companies whose products may have a lower manufacturing cost. Local industry can now offer prompt weekly delivery meaning fast inventory turnover for the Latin customers, lower packing, handling, insurance and freight costs through roll-on, roll-off trailerized shipments, with minimized losses. As the facilities of the new port are completed and the channel deepened to handle the deeper draft vessels, general cargo operation volumes can be expected to increase in future years at an accelerated rate.

One of the major problems facing all south Florida ports is the discrimination which exists in rail freight rates. A Southeast Florida Ports Committee has been formed to seek adjustment in rates from the Interstate Commerce Commission. Rail rates, under present ICC rulings are substantially higher between southeast Florida cities and the midwest than they are for other ports in the "south Atlantic Group." Consequently, New Orleans, Savannah, etc. are better equipped to export the goods produced in midwest industrial centers to Latin American markets. The Port of Tampa has already been successful in obtaining reductions on rail rates to the midwest. The success of the Southeast Florida Ports Committee in doing likewise will be a great aid in building Latin American and Caribbean cargo trade.

Passengers

Passenger trade volume at the Port of Miami has been growing steadily in spite of some annual fluctuation and is expected to grow at a greater rate when the new terminal is completed and the harbor and channels deepened. As of December 1968, the Port of Miami has a fleet of nine cruise ships. The terminal being constructed at Dodge Island is designed to handle five, and although only two-fifths complete, is handling that number. They are: the Sunward, Starward, Freeport, Boheme and Flavia. In addition, four more cruise ships are operating out of the old mainland port facilities. These are: the Bahama Star, Ariadne, Jamaica Queen and Cabo Izarra. Obviously, the Dodge Island terminal will have to expand if all these ships are to be accommodated. The terminal has been designed with such expansion

in mind, and additional berthing spaces and terminal "pods" will be added west of those under construction.

Most of the cruises are short jaunts to Freeport and Nassau, although cruises also are available to Jamaica, Puerto Rico and the Virgin Islands. Many tourists who come to Miami make a cruise to the Bahamas a part of their itinerary.

While Miami has handled cruise ships destined to Nassau and other nearby islands, Port Everglades has been the port of call for the larger, deeper draft vessels carrying luxury cruise passengers to major ports throughout the world. Though Miami is Florida's leading tourist center and the major metropolis on the Southeast Florida coast, Port Everglades has had the following advantages for attracting the larger ships: 1) a deeper channel and turning basin, 2) a shorter channel from deep water, and 3) more adequate passenger facilities. Port Everglades has berthing facilities for several ships at one time, with more space under construction. A major new passenger terminal is proposed in the 1970 phase of the Port Everglades' Authority's master plan. These are temporary physical advantages which will soon be shared by the Port of Miami with the deepening project and the new terminal. All but the largest of the world's cruise ships will then be able to dock at Miami. The Dade County Seaport Department is confident that many, if not most of the steamship lines presently using Port Everglades will transfer operations to Miami when vessels can be accommodated. Miami has the type of cargo operation compatible with luxury cruise ships, in addition to having the advantages of a major resort center, a mature city, and a more beautiful harbor, skyline and approach. Cruise passengers heading into Government Cut are greeted by the glitter of Miami Beach and the verdure of residential islands, not by petroleum storage tanks.

Luxury cruise operations are seemingly affected by several things, including economic recessions and the political stability of the islands or nations visited. Although cruise passenger volumes have historically followed a seasonal pattern, as has tourism in general, this seems to be leveling off. Numbers of cruise passengers moving through Miami still tend to peak at the height of the winter tourist season, with lower levels of activity occurring in July and August, indicating that the cruise lines draw much of their business from the large winter tourist population. Conversely, Floridians and tourists from nearby states tend to travel in the summer months to this area and make their lesser contribution to the cruise trade at this time. Though the midsummer tourist population in Miami now equals that of peak winter months, the summer tourists seem less likely to extend their trip with an ocean cruise.

In past years New York has been the major point of embarkation for pleasure cruises to the Caribbean, but its position has already been eclipsed by Miami. With the new terminal and facilities planned for Dodge Island, Miami should become the major home port for foreign-bound passenger liners in the United States, simply because of its climatic advantages and nearness to Latin America and the Caribbean. The preeminence of Miami in air travel is also important, because Miami, as a point of beginning for pleasure cruises, can be reached in a matter of hours by jet from any major urban area in the nation. Connections between air and sea travel in Miami have distinct advantages over those available in New York.

The number of trans-Atlantic passenger vessels catering to the very active U.S.-European summer vacation trade has been on the increase. It is possible that some of these will depart from, or make calls at the Port of Miami. Of more obvious benefit to this area is the fact that greatly reduced winter traffic on the U.S.-Europe route has enabled some of these ships to shift to Caribbean cruise routes during the winter months.

Reference to Table 7 will indicate Miami's ranking among the leading United States passenger ports, while Table 8 lists annual passenger totals at the port, on a fiscal year basis.

In October, 1967, Congress began studying a bill which would liberalize existing restrictions on cruise ship activity. This bill could greatly increase U.S.-flag traffic in both Miami and Port Everglades. Existing maritime law is complicated on the subject, but it may be summarized by noting that the Merchant Marine Act of 1936 prohibited:

1. Foreign flag carriers (most cruise ships are of foreign registration) from moving passengers between domestic ports without an intervening foreign stop — from New York to Miami, for instance, or from the U.S. mainland to San Juan.

2. Subsidized U.S. flag vessels from deviating from their scheduled runs and destinations except for 120 days each year, no matter what the need and demand for cruise service (all U.S. cruise and passenger lines are subsidized, so the restraint is total).

3. U.S. flag carriers from carrying passengers from one domestic port to another, one way, or round trip.

TABLE 7

RANK OF LEADING U. S. PASSENGER SEAPORTS
TRAVEL BETWEEN U. S. AND FOREIGN COUNTRIES
NUMBER OF PASSENGERS
1967 (CALENDAR YEAR)

Rank of Port	Arrivals	Departures
New York	371,797	352,826
MIAMI	130,081	130,971
Charlotte Amalie, V. I.	58,154	78,183
Port Everglades	51,641	32,995
Honolulu	26,964	26,068
San Juan, P. R.	20,510	19,458
Los Angeles	15,827	14,874
New Orleans	5,815	6,484
San Francisco	5,130	2,948
Agana, Guam	4,157	3,405
Palm Beach	2,108	2,746

SOURCE: U. S. Department of Justice, Immigration and Naturalization Service

TABLE 8
PORT OF MIAMI, PASSENGER
ARRIVALS AND DEPARTURES
1960-61 THROUGH 1967-68
(Fiscal Years)

Fiscal Year	Number of Passengers
1960-61	154,631
1961-62	221,752
1962-63	287,446
1963-64	252,442
1964-65	265,290
1965-66	203,371
1966-67	187,681
1967-68	245,687

SOURCE: Dade County Seaport Department

As transportation per se passenger ships cannot compete with jet age travel. But an ocean cruise is a holiday in itself for a growing market. Cruise travelers are forced to patronize foreign registry ships because the service is not available to them on U.S. lines. The bill considered in Congress was hotly contested by one major cruise line which operates out of New York to the Caribbean, Venezuela, and the west coast of South America, which now enjoys no competition, and by major rail, bus and airline companies. However, its passage likely will result in permitting U.S. cruise vessels to operate all year, and to engage in round-the-world cruises. They also can carry mail and cargo if desired. It will enable passengers to be carried between domestic and foreign ports, or to other domestic ports on either coast, round trip or one-way. Traffic between Atlantic and Pacific coasts will be unrestricted. Miami Congressman Claude Pepper, a sponsor of the bill, said:

> "...there is a great untapped market for one-way and round-trip ocean travel between North Atlantic and Gulf ports and Florida. If restrictions are lifted, passenger coastal service can be restored and also cruise ships could embark or disembark passengers at Miami who did not want to go the full voyage."

On June 22, 1968, the bill, H.R. 12639 was approved by both Senate and House of Representatives and became Public Law No. 90-358. The bill lifts the restrictions of the 1936 Act and permits cruise vessels to increase their activity without loss of subsidy, at the discretion of the Secretary of Commerce. The effect of this liberalization should be to increase passenger cruise activity at the Port of Miami.

Economic Effect

The Port of Miami was responsible for 75 percent of the waterborne exports and 50 percent of the waterborne imports for the entire South Florida Customs District, including all ports between West Palm Beach and Key West during 1967-68. Port revenue rose steadily from $680,000 in 1960-61 to $1,329,878 in 1967-68. (See Table 4.) The Seaport Department reported gains in port revenue at an average of 10 to 15 percent during the end of the fiscal year.

The value of cargo moving through the Port of Miami was proportionally higher than that in ports specializing in bulk cargo. As this port grows, the annual value of cargo handled should equal or exceed that of Jacksonville, highest in the State in 1967-68. Dade was Florida's most populous county and biggest consumer market, in addition to being the State's major center for tourism.

Applying a rule-of-thumb formula[1] to both cargo tonnages and passenger volumes, it can be said that in 1967 the port contributed $53,601,790 to the metropolitan economy, and that this contribution was increased in 1968 to $60,750,930. The Dade County Seaport Department is confident that the new port, which cost $25 million, will be contributing $75 million to the economy of the community annually by 1985.

Projections

Freight tonnage for the Port of Miami is estimated at three different figures, ranging from 2,100,000 tons to 2,500,000 tons. (See Figure 7) The middle figure of 2,300,000 tons is the projection forecast by this report.

Port trade statistics do not include local traffic because the majority of these movements do not touch port facilities and represent a small portion of total waterborne traffic in the area. Tonnage figures for the Port of Miami include only foreign and coastwise movements. They do not include the volume of traffic moved from point to point within a port, or to and from nearby inland waterways.

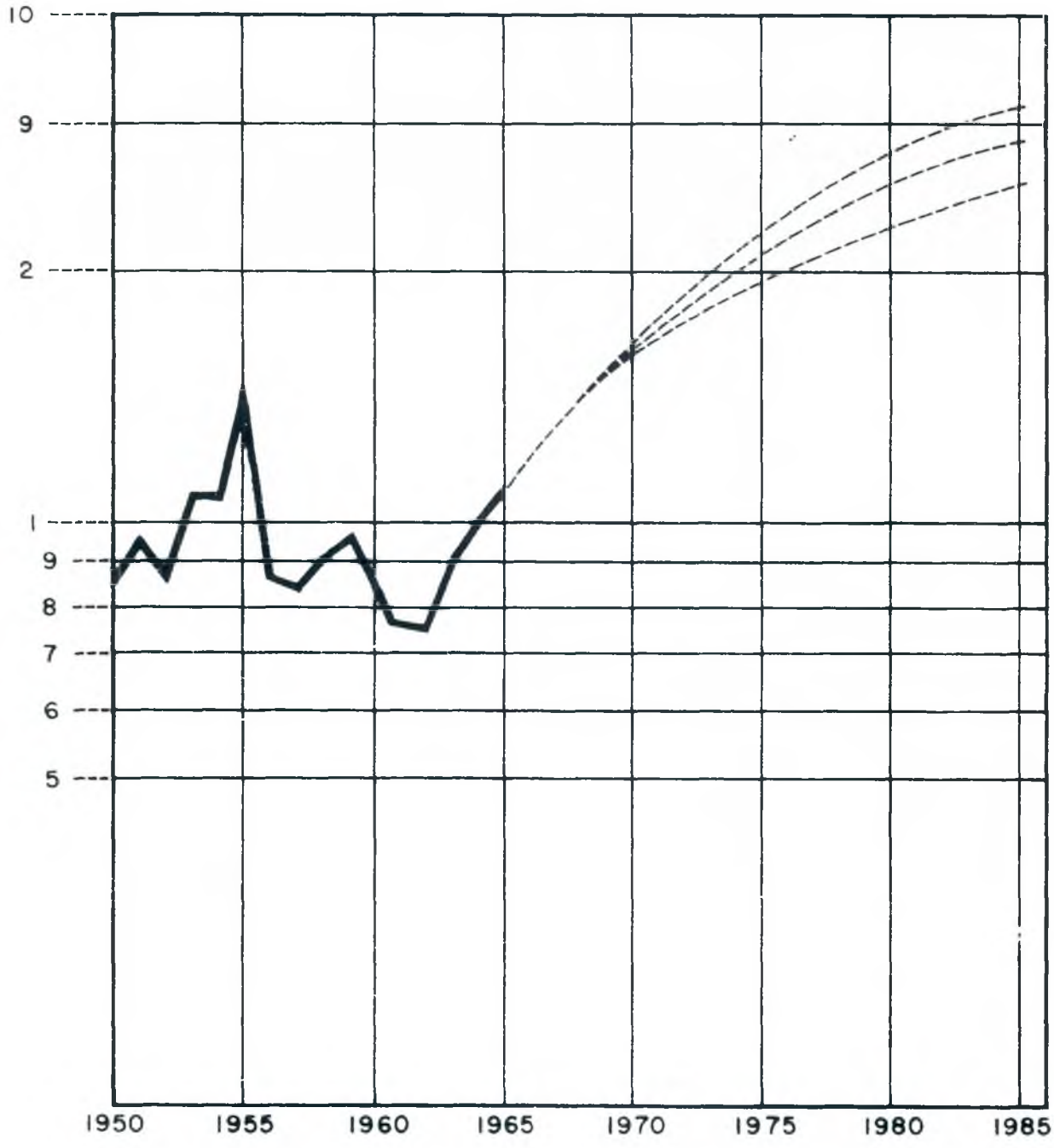
The high trend line for freight tonnage was established by using the same rate of increase as personal income. Personal income for Dade County was $2,749,860,000 in 1964 and has been projected to $6,790,414,000 for 1985, representing an increase of 146.9 percent. Applying a similar rate of increase to 1964, freight tonnage handled by the Port (1,007,800 tons) would yield a high 1985 projected tonnage of 2.5 million tons.

The low figure is based on a direct relationship between the growth of tonnage at a port and the population and economic growth of its tributary area. The most recently revised projection of Dade County population for 1985 is 1,955,000 persons. A corresponding reduction (19.6 percent) in projected freight tonnage would yield a low figure of 2.1 million tons for 1985.

As of 1960, Dade County's population was 944,450 persons and waterborne traffic was 872,400 tons. From initial projections, which placed 1985 population for Dade County at 2,433,000 persons, the total freight movement through the Port of Miami would approx-

(1) Assuming $20-30 goes into the local economy for each ton of cargo handled, and a contribution of $165 from each cruise passenger. The latter sum is composed of $100 for cruise fare, 90 percent of which is returned to the local economy, and $25 spent locally per day by each passenger, who stays and average of 3 days.

FIGURE 7 : PORT OF MIAMI, FREIGHT TONNAGE
(millions of short tons)
1950 - 1985 (three projections)



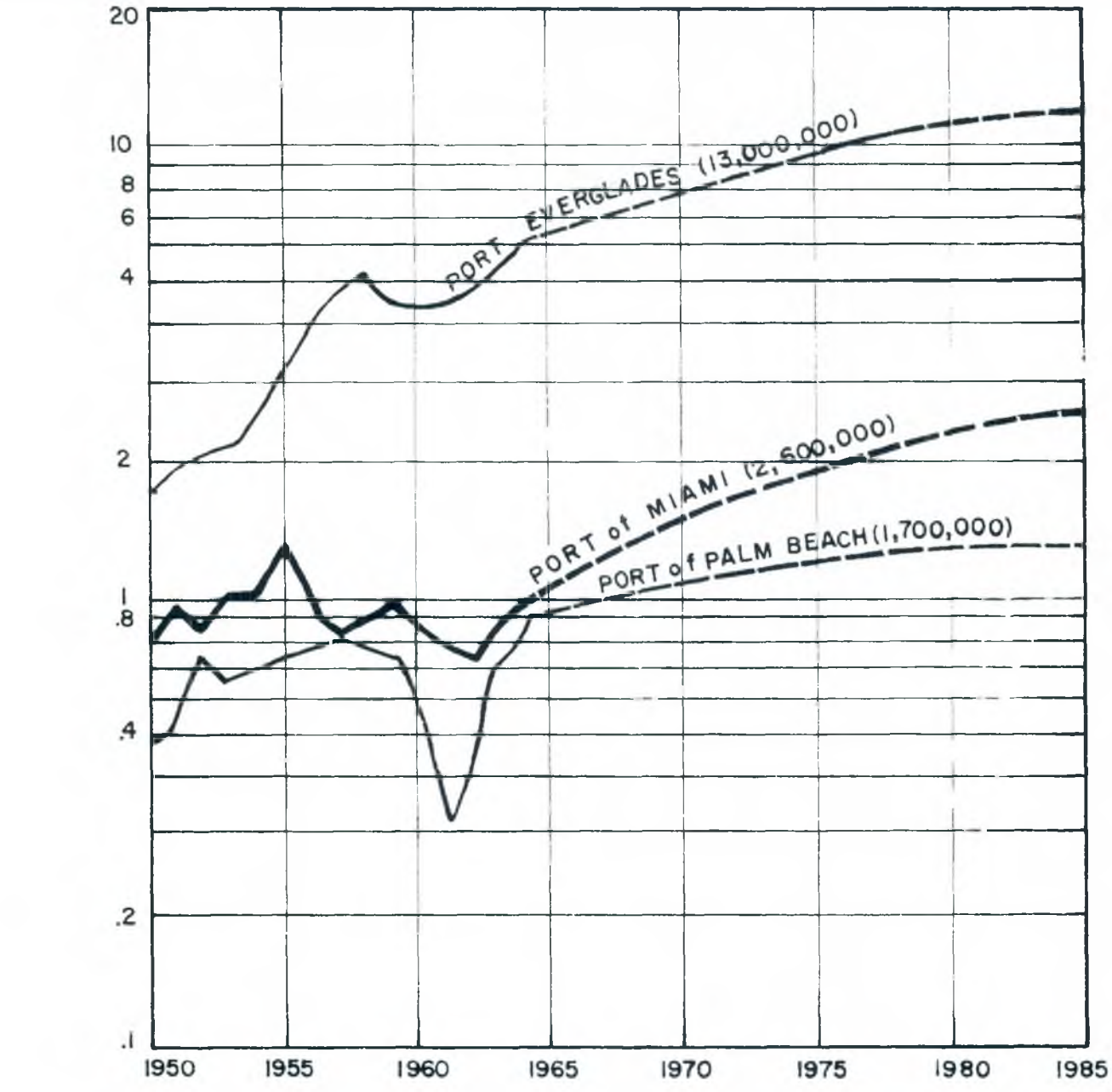
SOURCE: U.S. ARMY CORPS OF ENGINEERS, FIRST RESEARCH CORP.

imate 2.6 million tons. (See Figure 8, prepared by First Research Corporation for Port Everglades Authority in 1965, using the above population projection.)

With either the high or the low forecast, Dade County would be second to Port Everglades in freight volume in the Southeast Florida area, but ahead of the Port of Palm Beach, as shown on Figure 8. However, Miami would continue to lead Port Everglades in cruise passengers, according to the 1965 First Research projections (See Figure 9). By 1985 Miami should have approximately 700,000 passengers compared with Port Everglades' 300,000.

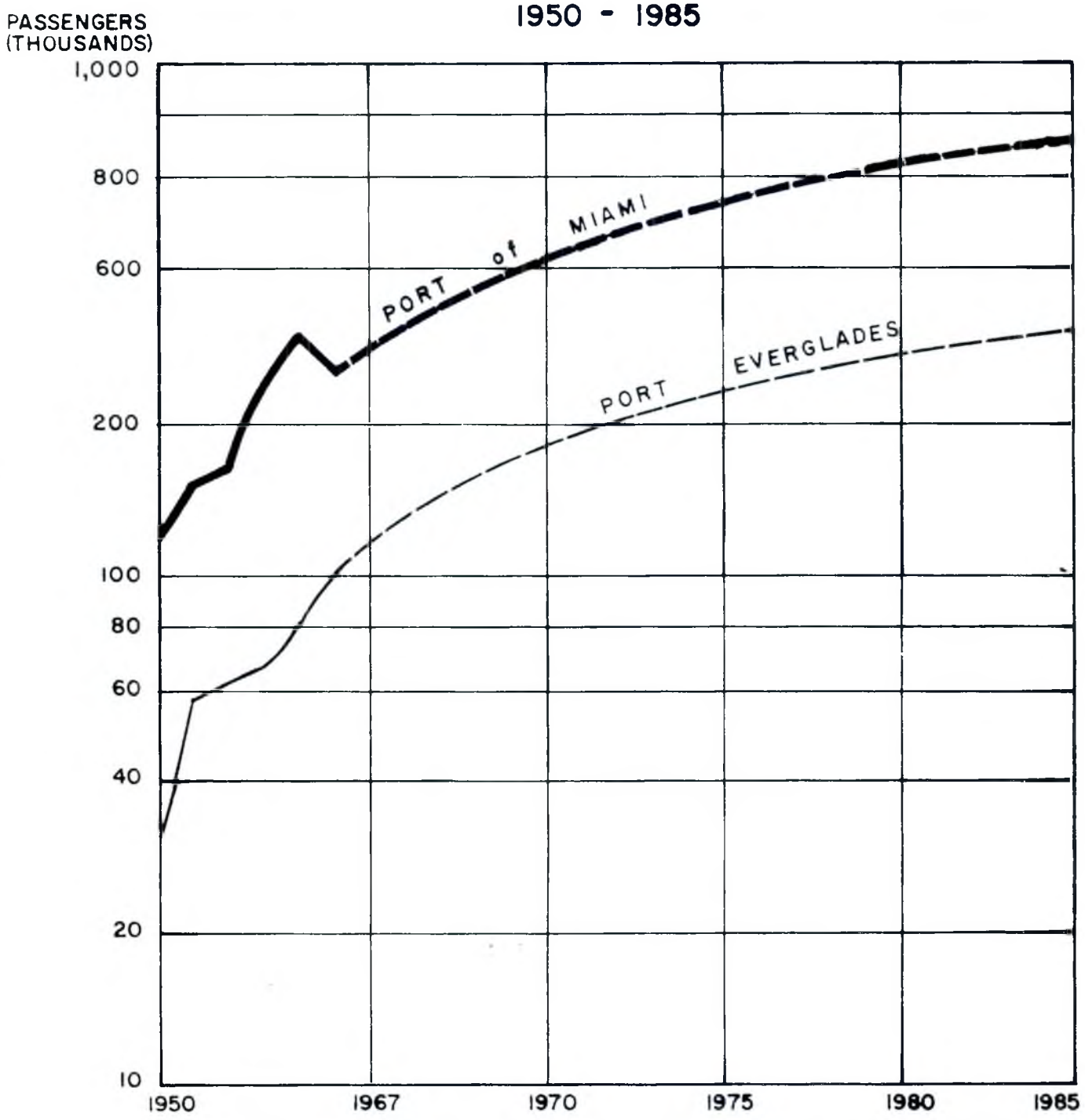
By arbitrarily bisecting the high and low curves with a middle trend line, the recommended freight tonnage projection of 2.3 million tons is obtained. While intangible factors such as the completion of a totally new port facility and a deepening of the harbor lead us to believe the higher projected figure will be reached by that date, the middle one is chosen because it limits maximum error to 50 percent in either direction.

FIGURE 8: FREIGHT TONNAGE, PORT EVERGLADES and PALM BEACH
1950 - 1985



SOURCE: FIRST RESEARCH CORP., for PORT EVERGLADES AUTHORITY

FIGURE 9: CRUISE PASSENGERS, MIAMI AND PORT EVERGLADES
1950 - 1985



SOURCE: FIRST RESEARCH CORP., FOR PORT EVERGLADES AUTHORITY

CHAPTER III

CONCLUSIONS AND RECOMMENDATIONS

The new Port of Miami facility, in operation though not completed, is a physical reality which must be taken into account as the best replacement of the obsolete port facility on Biscayne Boulevard. The Dodge Island location may now be accepted as an accomplished fact.

Development of port facilities in Dade County must also take into account the entire three-county "Gold Coast" economic region of southeast Florida. This is the hinterland to be considered in import and export operations. The Miami area is still the major population center of the region, serving as an "anchor" to the growing three-county area. The preponderence of south Florida's manufacturing is still located in Dade County, and it is important that Dade County maintain this role. The hinterland for cruise passengers embarking for the Caribbean and other destinations is not limited to the immediate area, not even the state of Florida. At present, Port Everglades in Broward County handles some of this passenger service, principally because Miami is not yet equipped to handle the larger cruise ships. When this deficiency is corrected, Port Everglades should lose much of its cruise ship trade to Miami.

Port Everglades, 20 miles to the north of Miami's port, has a good harbor and is close to deep water. The port handles large volumes of bulk and liquid cargo such as cement, stone, building materials, petroleum and other fuels, and serves the entire southeastern Florida economic region, including Miami. For instance, jet aviation fuels are transmitted from Port Everglades directly to Miami International Airport and Homestead Air Force Base by pipeline. Other bulk commodities are barged as far north as Ft. Pierce and as far south as Key West. These materials have a high bulk in relation to their value.

Miami, on the other hand, handles a great variety of packaged cargo at its port. This cargo generally has a high dollar value in relation to its bulk, a reverse of the situation at Port Everglades. Miami is well ahead of Port Everglades both in value of shipments and in number of passengers. Upon completion of the new Port of Miami facilities, this trend can be expected to continue and increase. The type of cargo handled by the Port of Miami encourages essentially "clean" operations, compared to those at Port Everglades. Also, this "clean" feature of Miami's port does not generate the same

type of associated industries such as the petro-chemical and refining industries found adjacent to Port Everglades.

A new industrial port in south Dade plus a carefully planned and operated facility at the Port of Miami would reinforce the competitive position of Dade County in water-borne transportation. These facilities will broaden the economic base of the county and serve general cargo activities now utilizing Port Everglades. At the time of this writing, Bechtel Corporation is completing a report on the feasibility of a new port of south Dade. This report is sponsored by the Miami-Dade Chamber of Commerce Committee of 100 and is financed by the Dade County Building Contractors' Association. This study will offer specific data on the advantages and limitations of this project in terms of Dade County's future economic and social needs.

RECOMMENDATIONS

The recommendations of the Seaports and Waterways Master Plan are:

- Develop the new Port of Miami at Dodge Island as the major passenger cruise port of southeast Florida.
- Develop the new Port of Miami at Dodge Island as a clean "roll-on, roll-off" packaged cargo operation.
- Give serious consideration to the development of a new port in south Dade to enhance the industrial and commercial activities of that area, and to possibly serve a new oceanographic industry.
- Construct an hydraulic model of Biscayne Bay with federal assistance to study the hydrological, biological and ecological aspects of the bay.
- Improve the Miami River along the lines of the Planning Study of the Miami River and the proposals of the Downtown Development Authority's Riverfront Development Plan.
- Provide public transit service between the Port of Miami and various sections of the metropolitan

area. Hydrofoil and hovercraft vehicles should be considered as possible complements to the entire transportation system, serving mainly tourists.

- Provide additional access to the new port by the construction of an alternate vehicular road. Proposals of MUATS include a continuation of the Port Causeway eastward to Fisher Island and a connection to the proposed South Beach Parkway from Miami Beach via a tunnel under the ship channel (see Figure 10).

Finally, all transportation facilities which bear a relationship to the development and access to the new Port of Miami are shown in Figure 10. Expressways are shown as proposed by MUATS to meet travel demands for the port area through 1985. Rapid transit proposals to and from the new Port of Miami, with connections to other parts of the Miami area are illustrated. And lastly, the principal waterways and seaports which form the basis of the Seaports and Waterways Master Plan are presented on Figure 11.

DISCUSSION OF RECOMMENDATIONS

Each of the foregoing recommendations are discussed on the following pages, both in terms of the goals of this plan and their relationship to the future development of Dade County.

Passenger Operations

The future of Miami as a major tourist cruise port seems assured once the channel and turning basin are deepened and the new passenger terminal completed. At present, Miami is in competition with Port Everglades in handling ocean cruise vessels. Most of these passenger lines have hinted that the only reason for their use of Port Everglades is its presently superior harbor and terminal facilities. Many have indicated they would prefer to relocate their operations when the Port of Miami is equipped to handle them. This is understandable, as Dade County is the major urban center in south Florida. The Port of Miami site commands a view of the downtown and Miami Beach skylines, and has easy access to the Miami central business district. The availability of a concentration of major hotels and tourist establishments makes this a desirable passenger port, particularly if more liberal legislation is enacted in Congress to permit cruise passengers to purchase one-way tickets and arrange for stop-overs en route to Miami. The development of a major

passenger port at Dodge Island appears to have few disadvantages.

Cargo Operations

The new Port of Miami is being designed to handle packaged cargo and "roll-on, roll-off" shipments of high value in relation to their bulk. Metropolitan Miami, as the southern anchor of the Gold Coast region, has the most diversified market in the region with its economy divided primarily among tourism, manufacturing and airlines activities. This type of port operation is relatively clean and can be compatible with the nearby residential islands and the general showcase atmosphere of the downtown bayfront and MacArthur Causeway with their parks and tourist facilities. Trade with the Caribbean and South America is expected to grow with Miami-manufactured exports playing an important role. The market for these items is increasing and modern methods for handling containerized cargo are coming into more universal use. The new Port of Miami is well prepared for this.

With the new port, Miami can be expected to surpass all other Florida ports in value of shipments. It will continue to serve as the distribution point within the Gold Coast area. Rail and truck lines are sufficiently developed to enable Miami's port to serve Dade, Broward, Palm Beach and Monroe Counties with waterborne consumer goods and luxury items. This cargo brings in more dollar value to the community than the bulk items which the Port of Miami is not designed to handle.

Port Everglades is not likely to offer much competition to Miami in this general cargo category. The Broward County port is not located in the heart of a mature metropolis, as is Miami's port. It is clear that the two, although only 20 miles apart and serving the same economic area, have different purposes and functions.

A decided advantage of the Port of Miami is that it will not develop into a large industrial port and handler of bulk goods. It is difficult to find any existing examples of a successful marriage of a tourist-oriented economy with heavy industrial port activity. New Orleans is renowned as a major tourist city, but its attractions are not dependent on a mild climate or the cleanliness of the Mississippi River. Long Beach, California, a city of oil wells and a bustling port, was originally a resort area. The accent is on the "was." San Diego and the San Francisco Bay area, both with growing ports, are faced with a slow decline in the amenities which caused them to be settled in the first place. This could happen in Miami.

Port planning in Dade County is being carried out by county agencies that are fully aware of the limitations and dangers

inherent in each type of port-related activity. A study nearing completion for the Dade County Seaport Department by the engineering firm of Tippetts, Abbett, McCarthy and Stratton (TAMS) calls for the continued development and expansion of the Port of Miami.[1/] Three general proposals in this report are:

1. Expansion of passenger terminal facilities to the south side of Dodge Island.

2. Expansion of "roll-on, roll-off" cargo facilities to the south side of Dodge Island and eventually to Lummus Island.

3. Improvement of the channel on the south side of Dodge Island to accommodate expanded passenger operations.

These improvements will enhance both the economic and aesthetic qualities of the metropolitan Miami area. The cargo operations are of a "clean" nature that will not conflict with passenger operations. Also, as Miami develops as an oceanographic center, provisions have been made at Dodge Island for the establishment of oceanographic study facilities on the south side of the island between the expanded passenger terminal facilities and the future "roll-on, roll-off" cargo terminal (see Figure 2).

South Dade Industrial Port

An industrial port in south Dade would specialize in bulk cargo such as is now handled by Port Everglades. This facility would be in addition to the general cargo and cruise operations at the Port of Miami. The development of an industrial port as discussed in this plan must be of a type compatible with the natural amenities of this metropolitan area and the goals expressed in this report.

1/ The first part of the expansion of the Port of Miami has already been planned and initiated. The Tippetts, Abbett, McCarthy and Stratton report presents proposals for the second phase of the Port's expansion. These proposals relate to the development of facilities, market analysis, and costs. The TAMS report used basic inputs supplied by MUATS. The consultants coordinated their work with the overall planning process in Dade County, thus insuring the total integration of their plans with the comprehensive transportation system being proposed for Dade County.

Such an industrial port is not planned for the Port of Miami. Even if expanded to include Lummus Island and some surrounding spoil areas, there would not be enough space available for a port of this type. Also, there is the question of its compatibility with the residential islands of Biscayne Bay and the Virginia Key area.

The question of economic feasibility will have to be carefully studied, quite aside from the problem of bay pollution. A new industrial port would complement the existing Port of Miami and reinforce the competitive position of Dade County in domestic and international markets. A south Dade port might also be justified by the economic benefits that would accrue to the south Dade region. These benefits would not be limited to industrial operations alone. Dade County's coastal location and the variety of marine life to be found in and around Biscayne Bay makes this area a potential leading center for oceanographic research. Miami is already on its way to such a position with the establishment of Federal oceanographic study facilities on Virginia Key. Still, little is known about the economic potential of oceanographic industries. However, it is conceivable that the magnitude of this new industry will be tremendous. Dade County's existing position in the field of marine science and its geographic location will enable it to take full advantage of the economic benefits that could come from this new science. A new port facility in south Dade would be a natural location for oceanographic study facilities, and could become the sole justification for the construction of this new facility. This would broaden the economic base of the south Dade area, and become a cause, not a result of a more diversified economy for this predominantly rural area. Such a facility is included in the development plans for the new Port of Miami. This should not, however, rule out the consideration of oceanographic facilities in any proposals for a port in south Dade.

Hydraulic Model of Biscayne Bay

The creation of a Biscayne National Monument to preserve the southern portion of Biscayne Bay has been approved and the conservation of south Biscayne Bay has also been recommended by the State Cabinet. A conclusion of this report is that the often discussed hydrological, biological and ecological study of Biscayne Bay, complete with hydraulic model, needs to be undertaken and substantially completed before much more is done to alter the natural conditions of south Biscayne Bay. Such a study will be costly, but its necessity has been pointed out before. Federal participation probably could be obtained through the U.S. Department of the Interior. If Miami is to become a major center for oceanography, the new port in south Dade and the expanded Port of Miami would probably benefit from this highly specialized activity.

The Miami River

The Planning Study of the Miami River, published by the Metropolitan Dade County Planning Department in 1962 and mentioned previously, has seen little implementation. Its objectives are still valid and should be acted upon. As port facilities are developed on Dodge Island, it is likely that the Miami River will experience a change in commerce and waterborne activity. It is time to concentrate on cleaning up this waterway and its banks and improving its visual aspects as an important element in the urban scene. The river will continue to be an important refuge for smaller boats during tropical storms. Stricter zoning requirements are needed to control dumps and junkyards along its banks. Acquisition of additional public parks and open spaces and a general beautification of the river will make it more appealing to visitors and encourage its use for sightseeing boats, etc. Small drydocks, boat sales yards and related activities are a natural use of the riverside, as are yacht basins and slips for houseboats. Seafood wholesale establishments also find a riverside location to their liking.

If the Miami River were cleaned up and the adjacent land beautified, the tourist potential of this waterway, not yet realized, may be such that it could develop in a manner similar to San Francisco's famed Fisherman's Wharf. The downtown section of the river, instead of being ignored by the city around it, could become a quality development of apartments, shops and restaurants, linked by parks and pedestrian ways, as has been done along the San Antonio River in that Texas city.

The Miami River, as Dade County's busiest inland waterway, needs considerable reworking as an urban waterway. This includes bulkheading the entire length of its navigable portion and a continuous cleanup effort. Another conclusion of this report is that if this river is to meet its potential as a viable economic and aesthetic part of Dade County, plans should be made for its improvement.

Other Modes of Waterborne Transportation

Because Miami and Miami Beach are waterfront communities, it would seem that some of the new innovations in self-propelled watercraft should be tested here. Biscayne Bay is a relatively calm body of water which does not experience the tidal fluctuations common elsewhere, and the climate does not make the use of the bay hazardous or uncomfortable. There is little reason why the surface of the bay could not be used to convey passengers from one point to another via high-speed waterborne transit. Logical routes for such service would link the Port of Miami, downtown Miami, and Miami Beach.

Eventually, it might prove feasible to extend service to Crandon Park and the newly created Cape Florida State Park. Both hydrofoil and hovercraft vehicles have great potential for use in this type of service. This could become an integral part of Dade County's developing transportation system, integrating land and water modes of transportation by employing regular schedules and fares, and a commuter service combined with charter tourist-oriented services. However, it is important to realize that this type of transportation will not substitute for rapid transit systems under consideration. These new forms of waterborne transportation will be oriented primarily towards tourists, and will be relatively expensive to purchase and operate.

Port Accessibility

The Port of Miami will be an important asset to the metropolitan area and must have good accessibility to all parts of Dade County. Figure 10 shows the transportation facilities proposed by MUATS which are related to the Port of Miami. Convenient access between the port and the County's expressway system is provided via a system of one-way streets from I-95 to the Port Causeway. A new highway link between the port and Miami Beach is proposed. This would be an extension of the Port Causeway to the proposed South Beach Parkway which crosses Government Cut to the north. The Port Causeway is planned to remain a two-lane roadway. However, it may be desirable to add additional lanes to handle increased cruise ship passengers arriving by automobile.

Railroad access to the Port of Miami is adequate for present and future demands for rail service.

The Port Causeway has been selected as the recommended route for a rapid transit link between downtown Miami and Miami Beach (see Figure 10). This proposed transit link will include a station at the Port. It is expected that this easy accessibility to the rapid transit system will reduce vehicular traffic on the Port Causeway.

This plan will be continuously reviewed and updated as part of the program outlined in the report titled Continuing Transportation Plan for Dade County. This process will enable planners, administrators and officials to accurately access the changing needs for seaport and waterway facilities, and to arrive at the best means of providing them. In this way, the needs of Dade County's growing population will be met no matter what direction these changes take.

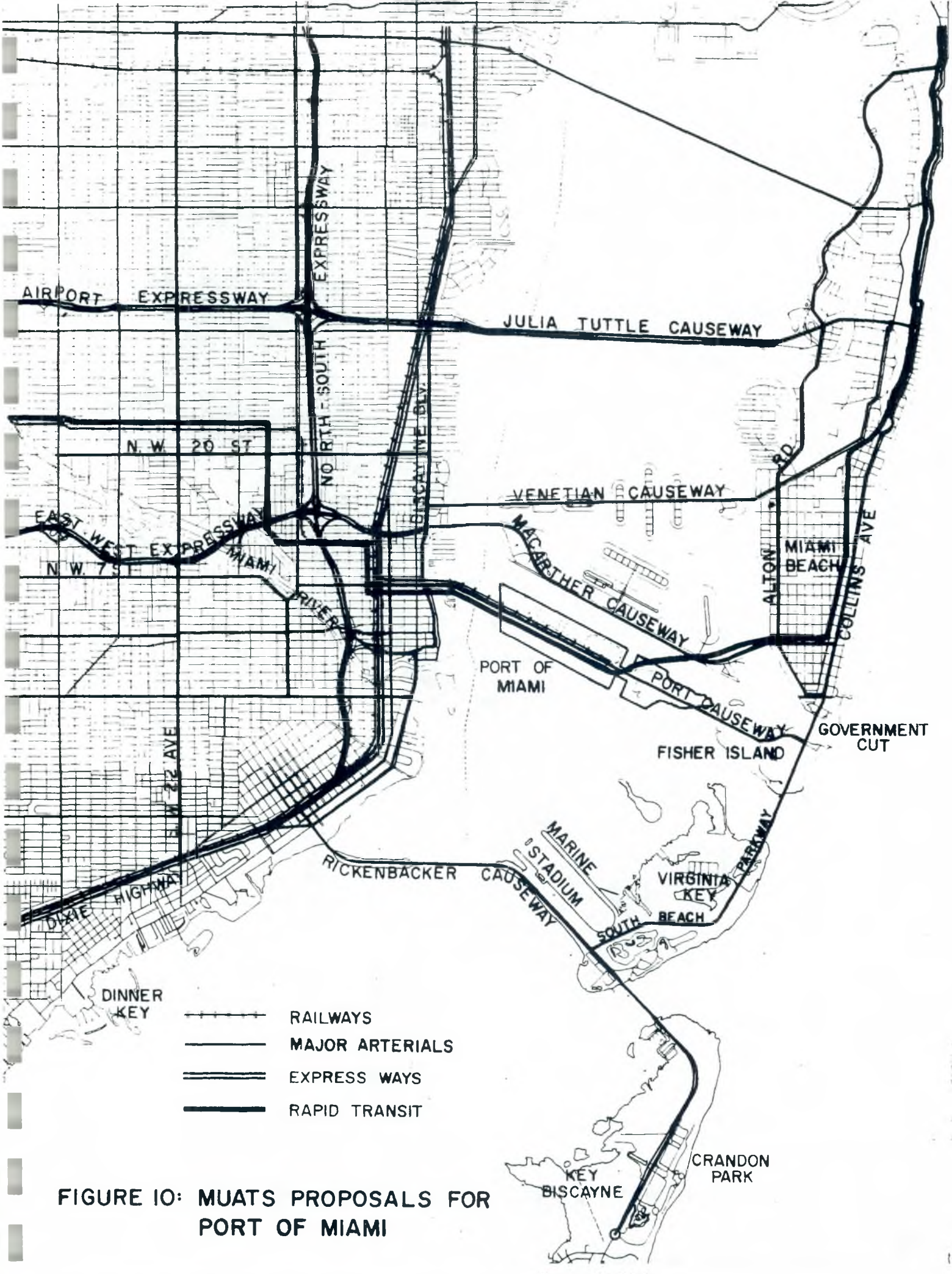


FIGURE 10: MUATS PROPOSALS FOR PORT OF MIAMI

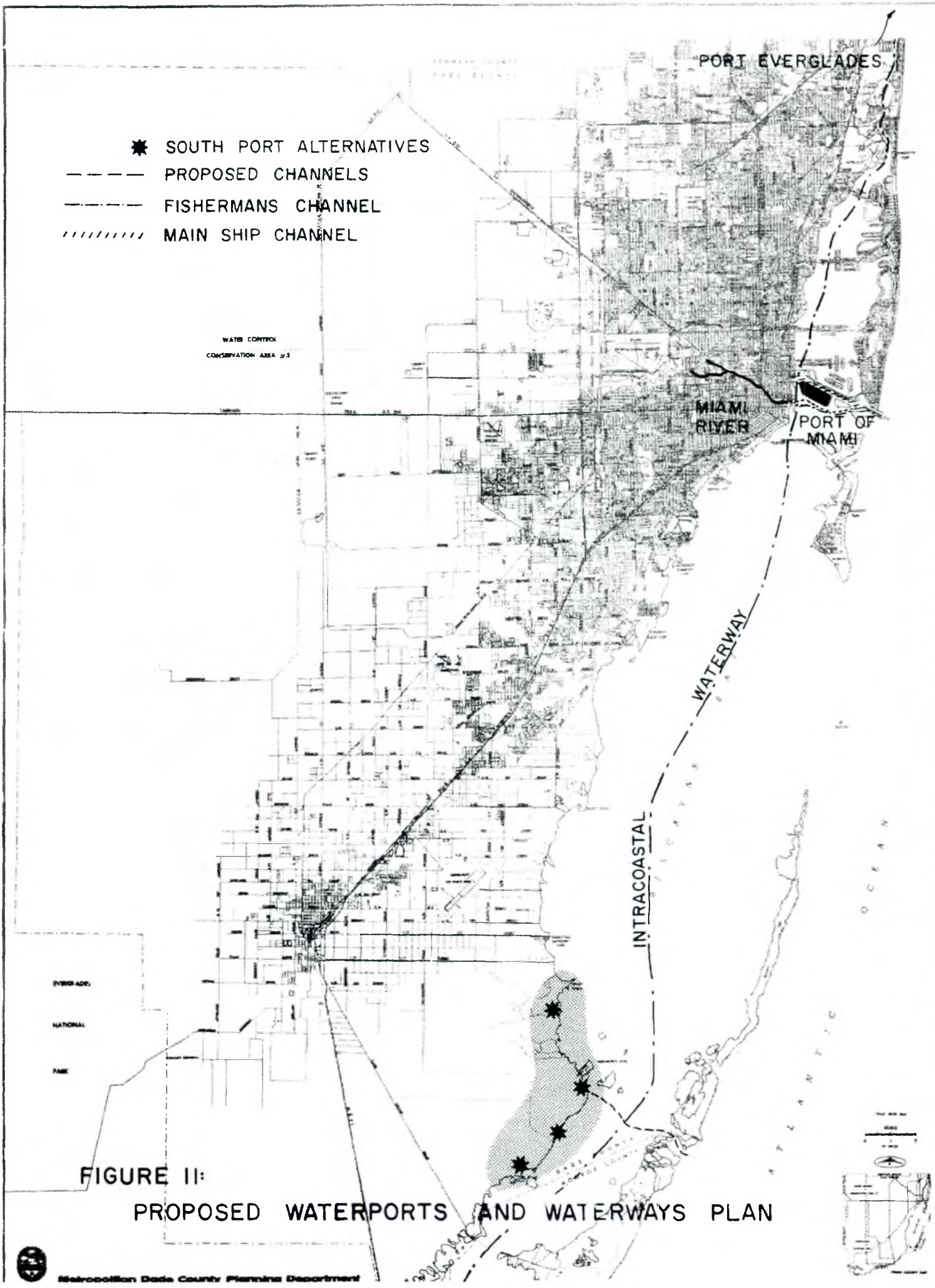


FIGURE II:

PROPOSED WATERPORTS AND WATERWAYS PLAN

Metropolitan Dade County Planning Department

APPENDIX

DADE COUNTY DEPARTMENT OF SEAPORT OPERATIONS
September 1968

IMPORTS	TONS	EXPORTS	TONS
Aircraft & Parts	3	Aircraft & Parts	1
Aluminum & Aluminum Products	1,223	Aluminum & Aluminum Products	147
Auto Parts	30	Auto Parts	292
Batteries	5	Batteries	24
Beer & Ale	435	Beer & Ale	306
Bicycles	32	Bicycles	9
Boats	2	Boats	47
Building Materials	49	Building Materials	1,505
Cement	29	Cement	335
Cigarettes & Tobacco	14	Chemicals	163
Clothing	34	Cigarettes & Tobacco	278
Cotton Goods	39	Clothing	40
Cylinders	23	Construction Equipment	97
Dinnerware	34	Cotton Goods	74
Earthenware	19	Cylinders	60
Electronic Equipment	223	Detergent	53
Fish	962	Electrical Equipment	69
Foodstuff	731	Feed	1,276
Footwear	130	Fertilizer	264
Furniture & Bedding	7	Fish	57
Glass	2,433	Flour	147
Hardware	106	Foodstuff	3,647
Household Appliances	77	Footwear	8
Lumber	621	Furniture & Bedding	225
Machinery	200	Glass	120
Mail	15	Hardware	61
Marble	317	Homes	66
Meat	1,827	Household Appliances	411
Nails	104	Lumber	2,016
Newsprint	7,587	Machinery	764
Nursery Stock	63	Mail	15
Oil, Olive	111	Meat	322
Optical Goods	102	Nails	10
Paper Products	195	Newsprint Cores	66
Pipe & Fittings	296	Nursery Stock	273
Plastic Products	54	Oil, Olive	20
Porcelaineware	46	Optical Goods	12
Rattanware	26	Paint	246
Seed	53	Paper Products	768

IMPORTS	TONS	EXPORTS	TONS
Sporting Goods	17	Petroleum Products	134
Steel & Steel Products	3,894	Pipe & Fittings	95
Textiles	753	Plastic Products	61
Tile	514	Plumbing Supplies	90
Tires	26	Rock, Sand	558
Toiletries & Drugs	1	Roofing	301
Toys	43	Scrap Metal	273
Trailers	2,729	Soybean Oil	121
Vehicles	392	Sporting Goods	10
Wine & Liquor	1,505	Steel & Steel Products	666
Wine	106	Tallow	116
Wood Products	774	Textiles	30
		Tile	86
		Tires	80
		Toiletries & Drugs	62
		Toys	57
		Trailers	2,389
		Vehicles	1,660
		Waste Cotton	14
		Water	12,981
		Wine & Liquor	19
		Wine	28
		Wood Products	759
General	636	General	4,936
Total	29,650	Total	39,627

DOMESTIC SHIPPING
September 1968

IN	TONS	OUT	TONS
Aluminum & Aluminum Products	50	Aluminum & Aluminum Products	8
Automobile Parts	15	Automobile Parts	5
Beer & Ale	101	Batteries	6
Building Materials	4	Boats	2
Clothing	48	Building Materials	85
Cylinders	1	Cement	72
Dinnerware	4	Chemicals	6
Fish	188	Cigarettes & Tobacco	49
Foodstuff	104	Clothing	2
Footwear	14	Cotton Goods	41
Glass	11	Electronic Equipment	11
Household Appliances	4	Foodstuff	672
Machinery	104	Furniture & Bedding	182
Mail	10	Glass	36
Optical Goods	12	Hardware	4
Porcelaineware	26	Household Appliances	283
Sporting Goods	3	Lumber	15
Steel & Steel Products	2,776	Machinery	177
Trailers	921	Mail	57
Vehicles	32	Meat	745
Wine & Liquor	30	Paint	21
		Paper Products	381
		Petroleum Products	34
		Plastic Products	26
		Plumbing Supplies	13
		Rock, Sand	14
		Steel & Steel Products	78
		Textiles	17
		Trailers	1,070
		Vehicles	218
		Water	190
		Wood Products	94
General	73	General	1,872
Total	4,531	Total	6,486

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