

# Water Taxi Feasibility Study

## FINAL REPORT



PREPARED FOR:

Sarasota/Manatee Metropolitan  
Planning Organization

PREPARED BY:

RENAISSANCE PLANNING GROUP



IN ASSOCIATION WITH:

ART ANDERSON ASSOCIATES

April 2005

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## EXECUTIVE SUMMARY

### INTRODUCTION

Achieving effective water taxi service in the Sarasota/Manatee region requires a unique partnership between public and private entities to successfully tap into market demand and meet the travel needs for visitors/tourists and workers. Such a partnership needs to match existing and potential private operators willing to participate in operating waterborne transportation services with public actions and investments. Those actions should include providing adequate supporting facilities and services, such as docking, sidewalks and transit service, ensuring development of complementary and proximate land uses at each destination, and establishing minimum regulations to achieve basic standards of operation. With the proper mix of public and private investment, the Sarasota/Manatee area, with its vast navigable waterways, is ripe for the expansion of the regional transportation system to include waterborne transit as an integral element.

There are challenges and areas of caution. A major one to consider is the current state of public transportation funding in the region. Both Manatee and Sarasota County transit systems have a history of uneven support, and rising costs against a relatively flat budget threaten the viability of current operations, particularly in Sarasota County. An investment in waterborne transportation may be viewed as a diversion of needed dollars from a transit system with real needs to meet the area's growing mobility problems. Furthermore, without relatively seamless connection to effective and available public transportation services, the water taxi initiative is likely to experience only marginal success, and may evolve into a purely excursion-focused endeavor during the season



*Successful water taxi service requires dedicated facilities located in areas of high density, with a diversity of land uses in close proximity to boarding areas. Redevelopment of the Sarasota Quay in downtown Sarasota presents just such an opportunity.*

or simply cease operations entirely as a public service. Those challenges can be overcome through careful redevelopment planning and design at potential water taxi terminals, and with continuing efforts by the MPO and its partners to improve public transportation service.

This Water Taxi Feasibility Study has been prepared under the direction of the Sarasota/Manatee Metropolitan Planning Organization (MPO), with participation from its

member local governments, key community stakeholders and members of the public. The final report is based on substantial community input including stakeholder interviews, field visits and two well attended public forums – a meeting to kick off the study in 2004 and a public workshop to present key findings and preliminary

recommendations in late January 2005. This feasibility study is intended to provide a conceptual plan and action steps for how waterborne transportation service could most effectively and efficiently operate in Sarasota and Manatee Counties. It addresses the likely costs of such a system, potential funding sources, and more detailed implementation considerations.

## **OVERVIEW OF FINDINGS AND RECOMMENDATIONS**

Waterborne transportation holds enormous potential for improving mobility, increasing accessibility and supporting redevelopment objectives in the Sarasota/Manatee region. As congestion levels build on area roadways and bridges, and the demand continues to rise for tourism, housing and jobs, the MPO and its partners must be creative in their use of limited financial resources to provide transportation options related to growth. As part of a seamless transportation system, water-based modes can extend the coverage and enhance the viability of public transportation in congested and constrained corridors, potentially to a much greater extent than programs like bikes-on-buses.

Water taxi service is feasible as an element of the area's transportation system that provides both social/recreational trips and one that enables commuters to reach destinations along coastal waterways and rivers. As the Manatee Island Trolley has demonstrated, benefits to both markets will likely occur through a well-designed system. Its feasibility is based on the potential demand spurred by redevelopment activity for at least three priority service areas, willing local government and private partners, and a relatively low capital and operating cost to provide initial service. Feasibility is clearly dependent on the degree to which the private sector is brought into this program as an active and equal partner. Public funding is needed to invest in starting up the service and keeping fares to a reasonable level, but achieving success with on-going operations requires a strong public-private partnership that ties marketing, promotion, destinations, facilities and equipment into a unified program that blends modest agency oversight with entrepreneurial energy and creativity.

## **PRIORITY SERVICE AREAS AND MARKETS**

Based on input from various stakeholders and interested parties, it is recommended that an initial pilot water taxi service begin operations within the City of Sarasota, with connections between the downtown area, Longboat Key, Mote Marine Laboratory and possibly Siesta Key. This pilot/demonstration project is recommended because the city has made the most progress of all local governments in securing facilities for water taxi docking and other amenities from developers, accumulating funds for development, and establishing an ordinance governing operating procedures and standards. This was also one of the strongest markets evaluated from a travel time, facility and public-private partnership perspective. More detailed analysis will be needed to define a specific route, operating plan and



*Ft. Lauderdale's Water Bus service is an excellent example of a public-private partnership with strong linkages to Broward County's public transportation system.*

financing. The MPO and City of Sarasota should consider a joint grant application to complete detailed planning and implementation activities, and possibly acquire vessels. Operations could be brokered with one or more private operators through a procurement process and renewable lease agreement.

Figure 1 highlights priority service areas, hubs and markets based on public input and technical assessment of candidate options. Service enhancements and expansion of waterborne routes may occur if the initial pilot project achieves success. There are other strong candidates for service, as shown in the figure, building upon the efforts of communities like Bradenton Beach to become a hub for water taxi service in the region. The map also depicts where the water taxi system can interface with local public transportation service. Strong candidate markets include the Englewood/Venice/Nokomis area, which would enable a linear water taxi route to serve a priority redevelopment district in Venice, provide strong linkages with a multi-use trail and Sarasota County Area Transit transfer point, and with public recreation sites like Jetty Park and Nokomis Beach. Several good candidate routes also exist in Manatee County, including Anna Maria Island, with service linking Bradenton Beach, Holmes Beach and other points with the mainland. Another candidate market would be service operating along the Manatee River. The most logical type of service would be use of diesel or electric monohull vessels operating with relatively short duration trips of higher frequency between downtown Bradenton, Palmetto and the Civic Center. A longer service market could run from Fort Hamer on the Manatee River east of I-75 to the downtown stops and out to Anna Maria Island or north to Tampa Bay. The Ft. Hamer connection will need to be further investigated in terms of navigable water depth given the potential uses of a water taxi vessel in other parts of the region. For example, a boat with shallow enough draft to serve Fort Hamer may be not big enough for a comfortable ride across the relatively open waters encountered between the mouth of the Manatee River, Sarasota Bay and upper Tampa Bay.

## **ESTIMATED COSTS AND REVENUES**

For the purposes of this feasibility study, general cost estimates were developed for three sample routes and types of service operating in the Venice area, Sarasota area and Bradenton area. Actual costs will differ somewhat based on the final operating plan and public-private responsibilities. To the extent practical, costs reflect local conditions in the Sarasota/Manatee area based on field visits and discussions with charter boat operators. For conceptual planning purposes, costs were developed for individual routes and a system of three routes serving the region, recognizing that economies of scale for administration, marketing and maintenance can be realized with a complete operating system. These are total costs, regardless of how the service is funded or provided.

Capital costs for vessel acquisition range from \$150,000 to more than \$2.5 million, depending on the type of vessel. The type of vessels needed will vary by market and passenger loads. Given the requirements for this region in terms of expected passenger demand, tides and weather conditions, a reasonable estimate is \$250,000 per vessel for planning purposes. At least two vessels will be needed per route, depending on desired frequency, with a spare available for breakdowns.

It is expected that an initial pilot program in Sarasota would entail capital costs of about \$500,000, and annual operating costs of just over \$500,000. Obviously, the amount of public costs could be reduced through private contributions, exactions or participation.

Annual operating costs are likely to be in the range of \$500,000 to \$750,000 per route, or \$2 million for a complete system comprised of three routes and seven vessels operating seven days a week for 12 hours of service per day, year round.

Funding sources include federal and state grants that are available or potentially applicable to cover capital and operating assistance for water taxi service, particularly if the service operates within a congested corridor and caters to functional trips. A local match is typically required. The City of Sarasota has limited funding available from development contributions to participate with a local match in a grant program. Fares would likely cover no more than 50 percent of operating costs for commuter-oriented service assuming discounts would be given to monthly pass holders. Fares generally should be in the \$2-\$5 range, with commuter fares near the low end and recreational/tourist fares at the high end of the range. Broward County has developed an effective way of linking its water bus system with its public transportation system by allowing unlimited use of its 31-day and 7-day bus pass to apply to unlimited rides on the water bus system. Other possible funding sources include revenue from advertising, promotions with public, private or non-profit entities, development exactions, and chartering the vessels for private functions and special events when the water taxi service is not operating.



## **NEXT STEPS/IMPLEMENTATION ACTIONS**

Along with the previous actions of the City of Sarasota through its Comprehensive Plan and ordinance, this report is the first formal step in development of a waterborne transportation system for the Sarasota/Manatee region. There are several subsequent activities needed to continue moving the program forward, if desired by the Sarasota/Manatee MPO and local governments. The actions listed below are generally in sequential order:

- MPO Board action is needed to endorse the concept of water taxi service and support development of a demonstration project;
- A more detailed operations/implementation plan is completed for a demonstration/pilot project. This should include developing ridership estimates, fares, more detailed operating costs, consultations with local operators regarding scheduling and vessel performance, and additional public involvement regarding specific terminals and routes;
- The MPO includes waterborne transportation in its 2030 Long Range Transportation Plan, ideally within the Cost Feasible element of the plan, indicating funding is likely to be available or commitments are in place for funding;
- A grant application is prepared, either jointly or individually, to obtain grant funds from the Florida Department of Transportation (FDOT) or US DOT FHWA (Ferryboat Discretionary Fund) to initiate the demonstration project;
- Performance measures are established that focus on patronage (passengers per revenue hour) and operating subsidy (percentage of operating costs), with details and measurable targets defined through the Level II operations plan;
- Demonstration project initiated for a period to be determined;
- An interlocal agreement and/or governance agreement is developed to promote regional coordination, consistency and performance monitoring;
- A model ordinance is shared and adapted, as necessary, for individual local governments;
- Funds are identified for service expansion and/or enhancement, depending on results of the demonstration project;
- Water taxi service will likely compete for congestion management funding and other MPO Transportation Improvement Program (TIP) funds, as service matures; however, it may be an effective way to attract additional funds for congestion relief, particularly if the service is regional in scope.

These steps could be modified or adjusted in terms of their order, but provide a basic framework of steps to achieve service development objectives.

## **MARKET OPPORTUNITIES AND CONSTRAINTS**

This section presents an overview of potential service markets in terms of their opportunities, initiatives and constraints. Questions are identified for most sites that should be answered in a more detailed operating plan if a next step towards implementation is desired.

### **SARASOTA**

Potential locations: Marina Jack, Sarasota Quay/Ritz-Carlton Hotel area, Marie Selby Botanical Gardens, New College/USF/Ringling area, Van Wezel/Centennial Park, Mote Marine, St. Armands, and Longboat Key (south end)

#### **OPPORTUNITIES**

Proactive city officials; popular and attractive waterfront; existing marina, hotels, Sarasota Quay redevelopment; 40-acre cultural district, downtown redevelopment efforts underway, including significant amount of residential development, and inclusion of water taxi in the city's comprehensive plan; improved inter-county transit service along US 41 (beginning in January); potential convention center project (in downtown or north Trail location near the airport). Since congestion is likely to worsen at Gulfstream Drive and US 41, and on the bridge to St. Armands and Longboat Key, a trolley serving the arts and cultural district in Downtown Sarasota and terminating at a ferry terminal at the Quay may be attractive to tourists staying in Sarasota and wanting to get across the water without driving. This would also eliminate the issues related to getting a dock at Marina Jack.

#### **CONSTRAINTS**

US 41 is a barrier between downtown and the waterfront, in terms of distance and traffic; insufficient water depth for consistent service to St. Armands; and there may be lease issues with Marina Jack (per discussions with city staff)

#### **QUESTIONS**

Whether a dedicated water taxi terminal will fit with Quay redevelopment plans? Parking availability? Docking availability at Marina Jack or other locations aside from the Quay? Potential for the trolley to return to provide mobility among destinations in the downtown area, along US 41 and to St. Armands?

### **MOTE MARINE**

#### **OPPORTUNITIES**

Prime visitor/tourist destination in Sarasota County. Mote Marine is interested in initiating service, using existing docks and has been in communication with the City of Sarasota on the subject. Operates under a lease agreement with the city; proximity to Pelican Man Sanctuary and Ken Thompson Park; presence of other amenities (restaurants, fishing, etc.). It would be desirable to

package tickets for the water bus and the aquarium, in conjunction with a scheduled tour, which may create an attractive tourist draw.

### **CONSTRAINTS**

This location will need additional infrastructure/site development, including pedestrian facilities connecting dock with buildings, etc. The area has relatively small commuter demand, resulting from a lack of a strong mix of uses or density of population and employment.

## **SARASOTA-BRADENTON INTERNATIONAL AIRPORT AREA**

### **OPPORTUNITIES**

Logical terminal to capture visitors/tourists who are staying on the islands; proximity to colleges and universities; enhanced US 41 bus transit service in operation beginning in January 2005; bi-county location makes it more likely to be supported by officials in both counties. There is potential for a dedicated water taxi terminal at the Powell Crosley mansion, which is adjacent to a site for planned university facility expansion. Discussion is ongoing concerning location of a proposed convention center in the general vicinity of the airport/county line. If such a location for the convention center is chosen, it would obviously strengthen the viability of this location as a prime water taxi terminal.

### **CONSTRAINTS**

Connection from water to airport; meaningful destinations (like, say, a car rental place or a hotel); lower income areas and lack of private investment; residential areas have relatively low densities. Service would likely have low ridership and would require long service hours, which together will create a need for higher subsidies than other routes being considered.

### **QUESTIONS**

Adequate docking facilities at Crosley Estate, Ringling Museum or New College?

## **BRADENTON-PALMETTO AREA**

### **OPPORTUNITIES**

Two existing marinas, downtown tourist/business destinations, presence of Manatee County Civic Center and potential adjacent hotel(s) at Haben Boulevard; DeSoto and Green Bridges expected to be significantly congested in the future. Significant redevelopment efforts to bring more residential, hotels and supporting commercial to the riverfront area, particularly around the civic center and the core of Palmetto, make this a more viable terminal than other locations. Service can operate at adequate speeds from Fort Hamer on the Manatee River all the way to downtown Bradenton or Palmetto, and out to the Island, which would provide an alternative service along increasingly congested roadways like US 301 and SR 64.

Joint marketing effort by restaurants at the two marinas could generate demand for a lunch and/or evening service, similar to one that currently operates during the summer in Toledo, OH.

### **CONSTRAINTS**

Limited existing transit service at the waterfront, but deviation of routes is likely possible to serve terminals in the future. Primary market is lunch, dinner, and nightlife. Hospital/institutional land uses unlikely to generate substantial ridership. Water depth and the narrow river may be a factor limiting vessel sizes and speeds for any connection with Ft. Hamer. This will need to be further investigated.

### **ENGLEWOOD, VENICE, NOKOMIS AND CASEY KEY**

#### **OPPORTUNITIES**

Proactive city officials, waterfront destinations, potential tie-in to Sarasota County trail network and SCAT transit service at the historic Venice Train Depot (intermodal facility); mixed-use development potential for the Venice Airport (hotel, restaurants, retail); presence of mixed use development along intercoastal waterway and redevelopment opportunities; Nokomis Beach public park provides access to beach and Intercoastal Waterway. A potential market in Lemon Bay area should be considered as an extension of a core route between the airport and Nokomis Beach.

#### **CONSTRAINTS**

Distance from other destinations for regional connectivity; grade differential on the Intercoastal Waterway through downtown Venice; short distance to cross the Intercoastal from one side to the other; length of connection between the Venice Train Depot intermodal facility and Venice Avenue downtown core; low densities on Casey Key and in the Englewood area.

### **MANATEE COUNTY ISLANDS**

Potential Locations: Anna Maria, Holmes Beach, Bradenton Beach, Longboat Key (north end)

#### **OPPORTUNITIES**

Proactive city officials, multiple tourist destinations, infrastructure in place or planned, relatively compact, walkable retail districts with nearby short- and long-term residential uses; convenience to mainland (comparable travel times, particularly during peak season); intermodal connections with the successful and distinctive Manatee Island Trolley; presence of marinas/docks; presence of commercial nodes, the Bridge Street Pier and municipal infrastructure investments through a community redevelopment agency; beach parking and road capacity constraints make travel options more viable. Existing and potential anchorage helps support the market for water taxi service. Park and ride lot under consideration at southern edge of Bradenton Beach. Substantial investment through grants in non-motorized transportation, including sidewalks, bike facilities and multi-use trails in Bradenton Beach and along SR 789.

#### **CONSTRAINTS**

Pedestrian infrastructure/connectivity is sporadic in places. Manatee and no-wake zones require longer transit times. Density and population growth is limited.

## **POPULATION AND EMPLOYMENT CONCENTRATION**

Figure 2 shows the 2000 and projected 2030 population and employment within ½ mile of the strongest candidate water transportation terminals in the Sarasota/Manatee area. The locations for potential terminals on the map reflects discussions with key community stakeholders, including local government representatives and charter boat operators, and input received from the April 2004 water taxi forum hosted by the MPO. A field review in November 2005 confirmed the viability of these locations. The source of the data is the 2000 validated tri-county travel model, developed by the Florida Department of Transportation, which reflects the 2000 Census for population and InfoUSA for employment data. The 2030 data is now being used in the development of the MPO's 2030 Long Range Transportation Plan, and is based on projections from the state's Bureau of Economic and Business Research at the University of Florida, as allocated in the region based on adopted comprehensive plans, vacant land and redevelopment.

**Figure 2 – Population and Employment**

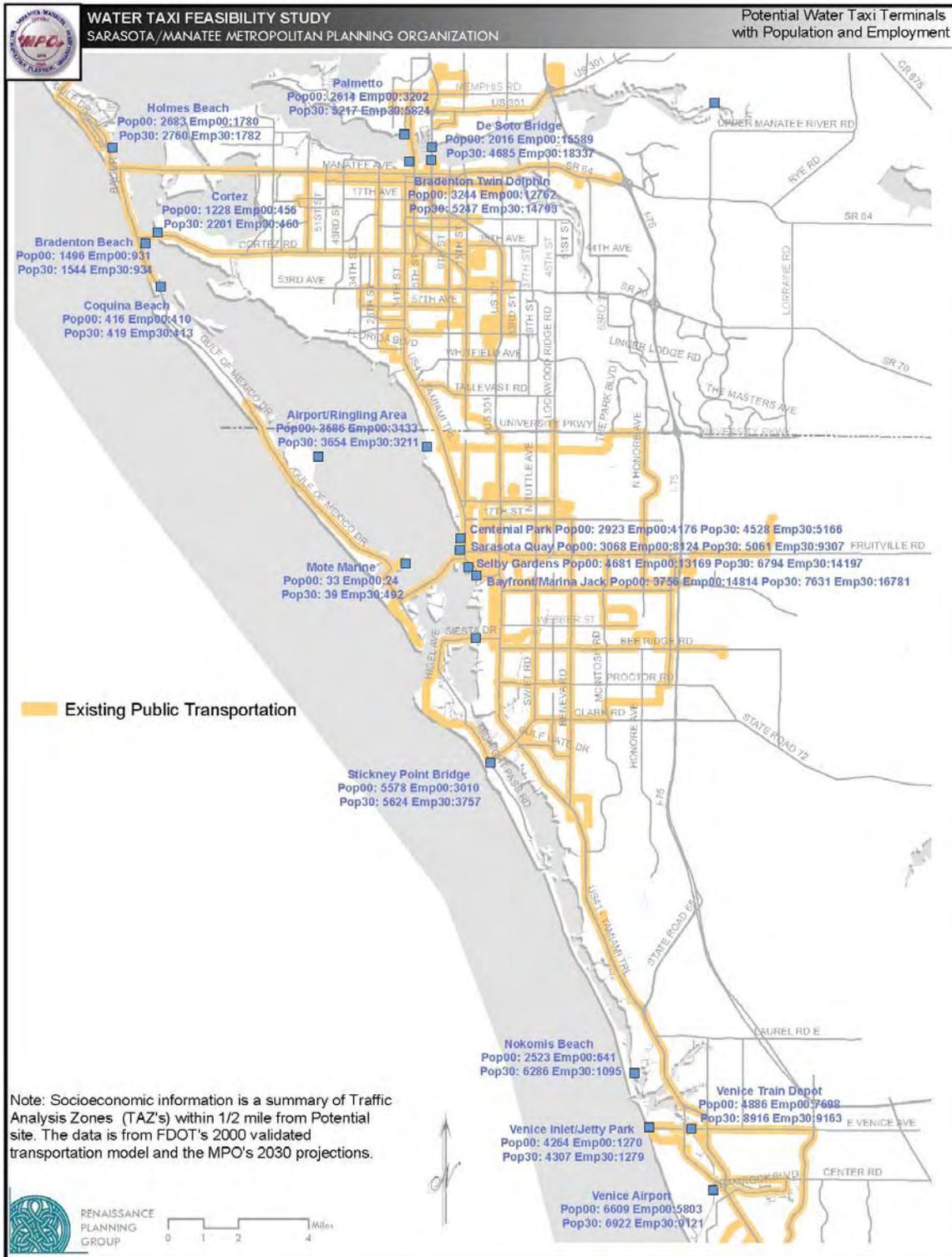


Table 1 summarizes the data by terminal location, showing density of population and employment within the immediate market area of the stop, defined as a ½ mile radius. As shown in the table, the locations with the highest concentration of people and jobs are in downtown Sarasota and along the Manatee Riverfront. However, locations in Venice also score high, particularly in total population and employment along the Venice Intercoastal Waterway.

This map and table provide an indication of which destinations are likely to be most supportive of water taxi service in terms of *potential demand*; however, the table does not reflect anticipated growth in these areas pending completion in the next couple of weeks of the 2030 socioeconomic forecasts for the region. In addition, the numbers do not reflect measures of proximity to the water for the people and jobs shown. Bradenton Beach, Holmes Beach, and Mote Marine, for example, do not have large concentrations of permanent housing and jobs, but they are extremely proximate to the water and experience high demand for travel. As such, these island destinations provide an excellent pairing with heavy population and employment concentrations in downtown Bradenton and downtown Sarasota.

NAME	2000	2000	2000	2000	2030	2030	2030	2030
	Population	Employment	Population Density (per acre)	Employment Density (per acre)	Population	Employment	Population Density (per acre)	Employment Density (per acre)
Mote Marine	33	24	0.3	0.2	39	492	0.4	4.6
Sarasota Quay	3,068	8,124	5.5	14.5	5,061	9,307	9.0	16.6
Bayfront/Marina Jack	3,756	14,814	7.0	27.7	7,631	16,781	14.3	31.4
Selby Gardens	4,681	13,169	6.7	18.8	6,794	14,197	9.7	20.3
Stickney Point Bridge	5,578	3,010	3.5	1.9	5,624	3,757	3.5	2.3
Venice Inlet/Jetty Park	4,264	1,270	6.6	2.0	4,307	1,279	6.7	2.0
Venice Airport	6,609	5,803	2.4	2.1	6,922	9,121	2.6	3.4
Venice Train Depot	4,886	7,698	4.0	6.3	8,916	9,163	7.4	7.6
Coquina Beach	416	410	2.2	2.2	419	413	2.2	2.2
Cortez	1,228	456	2.5	0.9	2,201	460	4.5	0.9
Bradenton Beach	1,496	931	4.3	2.6	1,544	934	4.4	2.7
Bradenton Twin Dolphin	3,244	12,762	6.6	25.8	5,247	14,793	10.6	29.9
Palmetto	2,614	3,202	4.8	5.9	5,217	5,824	9.6	10.7
De Soto Bridge	2,016	15,589	4.2	32.3	4,685	18,337	9.7	38.0
Centennial Park	2,923	4,176	5.9	8.5	4,528	5,166	9.2	10.5
Airport/Ringling Area	3,586	3,133	3.1	2.7	3,654	3,211	3.2	2.8
Holmes Beach	2,683	1,780	4.8	3.2	2,760	1,782	5.0	3.2
Nokomis Beach	2,523	641	2.8	0.7	6,286	1,095	7.1	1.2

Table 1 – Population and Employment by Terminal Area

## EVALUATION MATRIX

### POTENTIAL MARKETS

Based on the above locations, several likely waterborne transit service markets have been identified. These markets do not represent routes for waterborne service, but rather pairs or groups of origins and destinations that make sense given geographic, socioeconomic and transportation conditions.

The lines between these origins and destinations suggest actual routes to be used by an operating water taxi service, but the routes developed during the future implementation phase will vary based on infrastructure, passenger demand, environmental factors, other criteria, and – likely – funding. For example, the service may operate as a circulating route among several stops, or a route may vary at different times of day based on tides or traffic demand. A downtown or marina may act as a transfer point or hub for inter-regional, intra-regional, and local trips, whereas a dock in a smaller town or commercial area may just be a whistle stop. Similar to bus or train service, the water taxi may offer express and local service depending on the type of traveler (tourist or commuter) that is being served. These and other service characteristics are considered in this feasibility study and will be examined in more detail as the water taxi system is implemented.

## **EVALUATION CRITERIA**

The criteria used to evaluate each potential market were developed in Tech Memo 1. These criteria have been translated into a three-tiered ranking system. The legend below defines the general parameters of the symbols used in the evaluation matrix:

●	High	High level of support for water taxi service
○	Medium	Average or moderate support
•	Low	Low support

These are generalized parameters projected for Sarasota/Manatee’s water taxi service, and that further refinement will occur as the system is implemented. Performance measures once service is implemented should focus on passengers per revenue hour of service and operating subsidy as a percentage of operating costs.

Table 2 – Evaluation Measures

	● High	● Medium	● Low
Estimated Travel Time	Less than 30 minutes	30 to 60 minutes	Over one hour
Vessel Size Needed	Large (Over 49 passengers)	Medium (25 to 49 passengers)	Small (fewer than 25 passengers)
Existing Facility	Large Marina, Shelter available	Small Marina or covered dock	Small dock or no existing facility
Frequencies	More than two departure per hour	One departure per hour	Less than one departure per hour
Environmental Issues	None known	(n/a)	Known environmental issues
Tides, manatee or speed zones	Trip frequency and speed not affected	Significant portion of route passes through manatee or speed zone	Route entirely within manatee or speed zone
Connectivity to public transportation	Within ¼ mile of: <ul style="list-style-type: none"> <li>▪ 2 or more bus routes OR</li> <li>▪ 30 min. or better frequency</li> </ul>	Within ¼ to ½ mile from at least one route	More than ½ mile
Connectivity to existing or planned bike, ped, greenways/trails	High accessibility – connected sidewalks, trails, bicycle paths to activity center/ downtown/ destination within ¼ mile (5 min)	Moderate accessibility – some sidewalk gaps or bicycle or trail facilities to destination within ½ mile (10 min)	Poor accessibility – sidewalk gaps, no bicycle or trail facilities, distance to destinations over ½ mile
Alternative to congestion	Provides direct (point-to-point) service in heavily congested corridor or bridge	Provides indirect service in heavily congested corridor	Service not within congested corridor
Parking availability (current)	Adequate parking available (within ½ mile)	Moderate parking available	Parking limited
Supportive Development Plans	Plans for market (O and D) that include a mix of land uses, strong pedestrian accessibility, water taxi facilities and other demand-inducing strategies	Plans for either O or D that include any or all of the development criteria	No plans that directly support the land use and transportation needs of water taxi service

Table 3 – Evaluation Matrix

Potential Service Markets or Routes		Trip type	Travel time	Likely Vessel Size	Existing Facility	Likely Frequencies	Environmental Impact	Public Transit Connectivity	Trail / Path Connectivity	Congestion Alternative	Parking Availability	Supportive Plans
<b>North</b>												
Bradenton or Palmetto to St. Petersburg or Tampa Channelside		Inter	○	●	●	●	○	●	●	●	○	○
Ellenton-Palmetto-Civic Center to downtown Bradenton		Local	●	●	●	●	●	●	●	●	○	○
Ft. Hamer-Palmetto-Civic Center to Anna Maria Island		Intra	○	●	●	○	●	●	●	●	○	○
Holmes Beach to Bradenton Beach to Cortez Village		Intra	○	○	●	●	●	●	○	○	●	●
Island Hopping (Anna Maria - Holmes Beach - Bradenton Beach - Coquina Beach - Longboat Key North)		Intra	○	○	●	○	●	●	●	○	●	●
<b>Central</b>												
Sarasota Quay to Mote Marine (Longboat Key South)		Local	●	○	○	●	●	○	○	○	●	○
Mote Marine to Airport area / New College		Local	●	○	●	●	●	○	○	●	●	●
Holmes Beach/Bradenton Beach to Sarasota Quay (Manatee County to Sarasota County)		Intra	○	○	○	○	●	●	○	○	○	○
Siesta Key to Sarasota Quay or Mote Marine		Local	●	●	●	●	●	○	○	○	○	○
<b>South</b>												
Venice Waterway to Englewood or Fort Myers/Lee County		Inter	●	●	●	●	●	○	●	●	○	○
Venice Waterway from Venice Airport to Jetty Park		Local	○	●	●	●	●	●	●	●	○	○
Nokomis Beach to Venice Airport		Local	●	●	●	●	●	●	●	●	○	○

The criteria indicate that shorter routes, such as linking Palmetto/Civic Center and Ellenton on the north shore of the Manatee River with downtown Bradenton, are potentially more feasible service options for the region. Other comparable service options that merit strong consideration include service along the Venice waterway between the airport and Jetty Park or Nokomis Beach, and linking the downtown Sarasota core area (such as at the redeveloped Sarasota Quay) with Mote Marine. Also worth additional consideration, subject to available docking facilities and supportive land uses, is a connection from the Airport area (e.g., the Powell Crosley mansion or New College) to Mote Marine or Bradenton Beach.

Each of those potential markets helps provide an alternative to congested roadway facilities or structures, links an important origin with a key tourist or economic destination, and enjoys a strong linkage with existing public transportation service to extend the reach of the area's transit system. Longer routes do not fare as well because of a lack of competitive travel times with automobile travel, and demand would likely be more sporadic.

### **VESSEL OPTIONS**

There are a large number of vessel types that may be suitable for one or more of the routes described above. Nearly all existing passenger-only ferry services use one of the following vessel types: battery-powered electric monohull, diesel-electric hybrid monohull, diesel monohull, diesel catamaran, or hovercraft. Each type has benefits and drawbacks that make it suitable for some services but not others. The factors affecting the selection of a vessel type include anticipated demand, water depth, navigational restrictions, and speed required. In general, electric monohull vessels are best suited for short, high frequency trips in weather-protected waters. Larger vessels reaching 60' or more will be needed in the Manatee River and Sarasota Bay due to weather and tidal circumstances. From a travel time/frequency of service perspective, it is preferred that selected vessels are able to maneuver under drawbridges without opening.

Battery-power electric monohulls are the only zero-emission marine vehicle currently on the market. They are clean and quiet but also rather slow and small. Some of the largest such vessels available currently in service are at the Edison-Ford Estates in Ft. Myers. These are 32' 6" long, carry 25 passengers, and cruise at 5.5 knots. They are well suited for very protected waters and short runs. They are typically limited to around 10 hours between charges so multiple vessels are needed for a single route for service durations of greater than 10 hours. With limited power available from the batteries, battery-powered vessels can not provide air conditioning or have any significant range.



*Electric boats like this one are effective for short trips of relatively high frequency in placid waters. Such vessels are oriented more toward tourists than regular commuters.*

Diesel-electric hybrid monohulls produce very little emissions and are quite fuel efficient. By using a diesel generator to charge the vessel's batteries as needed, they can operate for much longer before

needing to be refueled. The Ft. Lauderdale Water Taxi is a good example of this type of vessel. These vessels carry up to 72 passengers in climate-control cabins. The weight of the propulsion system limits the size and speed of hybrid vessels so the new Ft. Lauderdale water taxis are the largest of this type of vessel available with existing technology.

Diesel monohulls can be rather large and are most efficient at low to medium speeds. The newest diesel engines are very clean and can be fitted with selective catalytic reduction systems to achieve emission levels comparable to those of buses and heavy trucks. At low speeds, monohulls are very fuel efficient but as vessel speed increases, the amount of fuel required increases dramatically. Above 20 to 25 knots, almost all ferries are catamarans. Based on feedback from charter boat operators in the region, a larger vessel in the 60-65' range, such as this type or the diesel catamaran listed below, will be needed in the mouth of the Manatee River or Sarasota Bay due to tides and frequently challenging weather conditions.

Diesel catamarans are the most common passenger ferries for services requiring medium to high speeds and carrying large volumes of passengers. Catamarans typically have more complex hulls and machinery, and are therefore somewhat more expensive to build than monohulls of comparable capacity. As with all hull types, the final capital cost is highly dependent on the final outfit and level of finish.

Hovercraft are well suited for areas where water depth or ice prevent the reliable operation of displacement craft. The noise traditionally associated with hovercraft has been reduced by the use of diesel instead of turbine engines. However, the maneuverability of hovercraft can be a challenge in areas of high winds, especially cross winds. Because there is no hull in the water, a head wind reduces vessel speed by the speed of the wind and a cross wind requires the operator to run at high “crab” angles to maintain the desired track. Hovercraft machinery also tends to require more maintenance than traditional propulsion systems.



*Hovercraft are best suited for shallow areas requiring higher speeds. Recent improvements have reduced their noise impacts.*

Regardless of the vessel type chosen, the propulsion system should be designed to minimize the risk of waterborne transit operations to the local manatee population. This can be done by specifying either fully ducted propellers or waterjets. At speeds below 12 knots or so, ducting increases the thrust generated by the propeller, increasing its efficiency. At higher speeds, the drag caused by the duct, or nozzle, offsets the increased thrust, negating the benefit. At speeds above 20 knots, waterjets become economically competitive. Because all of a waterjet’s rotating machinery is located within the hull, there is no chance of the propeller striking a manatee.

The characteristics of existing vessels of each type are summarized in the table below.

Vessel Type	Capital Cost		Service Life Years	Route Location	Length ft	Beam ft	Draft ft	Cruising Speed knots	Installed Power HP	Est. Fuel Consumption GPH	Builder / Model
	High	Low									
25 Pax Electric	\$ 125,000	\$ 100,000	20	Edison-Ford Museum	32' 6"	8' 6"	2' 3"	5.5	4	0	Electric Launch Co
72 Pax Hybrid	\$ 300,000	\$ 250,000	20	Ft. Lauderdale Long Beach -	42' 0"	11' 6"	3' 0"	8	100	4	Canal Boats, Inc.
49 Pax Diesel	\$ 250,000	\$ 175,000	20	AquaBus	39' 11"	11' 10"	3' 5"	14	180	7	Willard Marine Kvichak-Griffon /
50 Pax Hovercraft			20	Griffin 3000TD Long Beach -			0' 6"	37	2 x 525	40	3000TD Kvichak Marine
80 Pax Diesel	\$ 1,500,000	\$ 1,250,000	20	AquaLink	67' 3"	23' 8"	3' 0"	28	2 x 600	46	Industries Derecktor
75 Pax Diesel	\$ 2,500,000	\$ 2,000,000	20	NY Water Taxi	53' 4"	19' 0"	4' 0"	25	2 x 600	46	Shipyard
150 Pax Diesel	\$ 2,500,000	\$ 1,750,000	20	NY Waterway	78' 6"		2'-6"	28	4 x 600	92	Allen Marine

**Table 4 – Existing Vessel Characteristics**

**OPERATING COSTS**

**LABOR**

The size of the crew required is dependent on the number of passengers carried and the vessel’s configuration. Prior to issuing a Certificate of Inspection, which is required to carry passengers, the local US Coast Guard Marine Safety Office must approve the vessel’s manning plan. It is strongly recommended that they be consulted early in the process to ensure the proposed plan will be acceptable. The following discussion is based on current operations and is provided as general guidance only.

For vessels with fewer than 50 passengers operating within protected waters, only an operator is generally required. The Long Beach AquaBus is a good example of this sort of operation. The route is relatively short and protected, there are four stops, each with a unique attraction, and the system is accessible for people with disabilities. For budgetary purposes, the rate for the operator of this size vessel should be about \$20 to \$22 per hour, exclusive of benefits.

For larger vessels, a master plus at least one mate/deckhand per deck is the usual complement. The licensing requirements for the master on larger vessels are more stringent and a rate of \$24 to \$27 per hour should be used for budgeting. Deckhands do not need formal training and should be budgeted at \$10-\$12 per hour. If a crew of three is required, the operating budget should include \$16 per hour for a mate/mechanic.

**FUEL & OIL**

The cost of fuel becomes a more significant factor in the overall operating cost as vessel size and speed increase. For most vessels, doubling the speed will result in quadrupling the fuel consumed, if such speeds are even possible. For pure displacement hulls, such as the electric and diesel-electric hybrids discussed above, there is a speed, known as the “hull speed”, which cannot be exceeded by an appreciable amount regardless of the power applied. As long as the vessel is operated somewhat below hull speed, the rate of fuel consumption will be relatively low. Marine diesel is budgeted at \$1.75 per gallon.

## **MAINTENANCE**

### **MACHINERY**

For the purposes of this feasibility analysis, the machinery maintenance costs are estimated as a function of the amount of fuel consumed. This cost includes both regular maintenance, such as changing the oil and filters, and annual maintenance, which requires taking the vessel out of service. While the vessel is out of service, the annual inspection required by the US Coast Guard is also conducted. For a 49 passenger, eight knot vessel, the annual maintenance cost is estimated at \$10,000 per year.

### **HULL & OUTFIT**

Hull and outfit maintenance costs are based on the number of passengers carried and includes daily and weekly maintenance as well as any work done during the annual haul-out, such as cleaning and painting the underside of the hull. For an 80 passenger vessel operating 3,000 hours per year, the annual hull and outfit maintenance budget will be approximately \$7,200.

### **TERMINALS**

To ensure high quality service, all of the terminals within the system will require periodic cleaning and maintenance. Regular cleaning of the terminals will likely be done by the same personnel who clean the other transit stops within the system and will have a negligible impact on that budget. Annual maintenance of the terminal piers, gangways, and floats will primarily consist of painting and minor maintenance, with an annual budget of \$2,500 per terminal per year.

### **MOORAGE**

The annual operating budget should include the cost of overnight moorage for the vessels. For this study, a budget of \$200 per month was assumed for each vessel.

### **INSURANCE**

The three types of insurance required for vessel operations are hull & machinery insurance, liability insurance, and pollution insurance. Hull and machinery insurance is based on the replacement cost of the vessel and generally costs 7¢ per \$1,000 of value. For an 80 passenger, diesel catamaran with a replacement cost of \$1.5 million, the hull and machinery insurance will cost about \$10,500 per year.

Liability insurance is a function of the number of passengers carried annually and is a fixed amount for the initial \$1 million in coverage, a somewhat smaller amount for each additional \$1 million in coverage up to \$5 million in total coverage, and yet another amount for each \$1 million above \$5 million. This liability insurance does not cover passengers before they enter the boarding facility or after they depart. For a system carrying approximately 50,000 passengers per year, \$5 million in total coverage will cost about \$13,000 per year.

Pollution insurance is required to cover the cost of any accidental fuel, oil, or other hazardous material spills. It is not required for electric boats. The amount of pollution insurance required is a function of the size of the vessel and the amount of fuel carried.

### **MANAGEMENT & ADMINISTRATION**

The operation of a waterborne transit system will require some support from personnel on shore. This shore-based staff will be responsible for managing the crews, scheduling maintenance, and ordering supplies. In addition, customer service and/or marketing support may be required, depending on the relationship between the waterborne service and the rest of the transit system administration.

For a system comprised of two or fewer vessels, the maintenance planning can be performed by the Chief Master, in which case only a general manager will be required. For a fleet of three vessels or more, a general manager, port captain, and an administrative assistant would be recommended. The annual budget for a General Manager should be \$65,000; for Port Captain, \$50,000; and for an administrative assistant, \$25,000. Benefits will add an additional 25 to 30 percent to these rates.

### **OVERHEAD**

Overhead costs include dock access fees, overnight vessel moorage, rents, utilities, license fees, etc. In addition to the administrative offices, a small workshop for vessel maintenance and parts storage will be required. The total overhead costs can be estimated at 12 percent of all other operating costs.

### **SAMPLE ROUTE COST ESTIMATES**

For each part of the study area, a sample circular route was developed and the capital and operating costs estimated. The results are shown in the tables below.

Leg	Distance (NM)	Speed (knots)	Leg Time (h:mm:ss)	Cum. Time (h:mm:ss)
<b>North Circle Route</b>				
Dep. Cortez			0:03:00	0:03:00
Cortez to Bradenton Beach	0.43	6.00	0:04:18	0:07:18
Arr/Dep Bradenton Beach			0:05:00	0:12:18
Bradenton Beach to Ana Mari	5.60	7.00	0:48:00	1:00:18
Arr-Dep Ana Maria			0:05:00	1:05:18
Ana Maria to Cortez	5.60	7.00	0:48:00	1:53:18
Arr. Cortez			0:04:00	1:57:18
<b>Central Circle Route</b>				
Dep. Dntn Sarasota			0:02:30	0:02:30
Dntn Sara to St. Armands	2.30	6.00	0:23:00	0:25:30
Arr/Dep St. Armands			0:05:00	0:30:30
St. Armands to Mote	0.60	6.00	0:06:00	0:36:30
Arr/Dep Mote			0:05:00	0:41:30
Mote to Sara Quay	1.60	7.50	0:12:48	0:54:18
Arr/Dep Sara Quay			0:05:00	0:59:18
Sara Quay to Dntn Sara	1.80	7.50	0:14:24	1:13:42
Arr. Sara			0:02:30	1:16:12
<b>South Circle Route</b>				
Dep. Dntn Venice			0:02:30	0:02:30
Dntn Venice to RR Station	0.10	3.00	0:02:00	0:04:30
Arr/Dep RR Station			0:05:00	0:09:30
RR Station to Jetty Park	2.00	5.00	0:24:00	0:33:30
Arr/Dep Jetty Park			0:05:00	0:38:30
Jetty Park to RR Station	2.00	5.00	0:24:00	1:02:30
Arr/Dep RR Station			0:05:00	1:07:30
RR Station to Dntn Venice	0.10	3.00	0:02:00	1:09:30
Arr/Dep Dntn Venice			0:05:00	1:14:30
Dntn Venice to Airport	2.20	5.00	0:26:24	1:40:54
Arr/Dep Airport			0:05:00	1:45:54
Airport to Dntn Venice	2.20	5.00	0:26:24	2:12:18
Arr. Dntn Venice			0:02:30	2:14:48

**Table 5 – Round Trip Time Estimates**

	Route Costs			System Costs
	North	Central	South	
Operating Days/Week	7	7	7	
Service Hours/Day	12	12	12	
# Vessels on Route	2	2	3	
Vessel Size (passengers)	49	49	49	
Minimum Headway	0:58	0:38	0:44	
Annual Operating Hours	9,636	9,636	14,454	
Round Trips/Day/Vessel	6	9	5	
Daily Round Trip Capacity	588	882	735	
<u>Fuel</u>				
Gallons/Hour	7.0	7.0	7.0	
Gallons/Year	74,197	74,197	111,296	
\$/Year	\$ 129,845	\$ 129,845	\$ 194,768	
<u>Lube Oil</u>				
Gallons/Year	7,420	7,420	11,130	
\$/Year	\$ 14,839	\$ 14,839	\$ 22,259	
<u>Operator</u>				
\$/Hour	\$ 26.00	\$ 26.00	\$ 26.00	
\$/Year	\$ 250,536	\$ 250,536	\$ 375,804	
<u>Maintenance</u>				
Machinery	\$ 19,477	\$ 19,477	\$ 29,215	
Hull & Outfit	\$ 14,165	\$ 14,165	\$ 21,247	
Terminals	\$ 7,500	\$ 10,000	\$ 10,000	
<u>Insurance</u>				
Hull & Machinery	\$ 3,500	\$ 3,500	\$ 5,250	
Liability & Pollution				\$ 18,000
<u>Homeport Moorage</u>	\$ 4,800	\$ 4,800	\$ 7,200	
<u>Office Rent</u>				\$ 7,500
<u>Maint. Shop Rent</u>				\$ 4,800
<u>Management &amp; Admin</u>				
General Manager				\$ 65,000
Port Captain				\$ 50,000
Admin Assistant				\$ 25,000
<u>Total Salaries</u>				\$ 140,000
<u>Benefits</u>				\$ 42,000
<u>Total Shore Personnel</u>				\$ 182,000
<b>Direct Costs</b>	<b>\$ 444,662</b>	<b>\$ 447,162</b>	<b>\$ 665,743</b>	<b>\$ 212,300</b>
Overhead	\$ 53,359	\$ 53,659	\$ 79,889	\$ 25,476
<b>Total Costs</b>	<b>\$ 498,022</b>	<b>\$ 500,822</b>	<b>\$ 745,633</b>	<b>\$ 237,776</b>
Total System Cost				\$ 1,982,252
<b>Vessel Acquisition</b>	<b>\$ 500,000</b>	<b>\$ 500,000</b>	<b>\$ 750,000</b>	

Table 6 – Sample Route Cost Estimates

## **REVENUE SOURCES**

Funding for waterborne transportation can come from various sources, potentially including grant assistance from the Federal Highway Administration's Ferryboat Discretionary Program and the Florida Department of Transportation's Congested Corridor transit funding program. The latter program may be particularly effective for service that provides an alternative for congested bridges on the state highway system. Those sources may be used for both capital and operating costs; however, they are typically limited in duration, with the expectation that local sources will eventually be used to cover costs.

More than likely, there will be a need for local funding to cover development costs to initiate water taxi service, and to cover operating costs not covered by passenger fares, fees or advertising revenue. Revenue from fares can be expected to cover up to 50 percent of operating costs for commuter-oriented service, and a higher percentage of operating costs for recreational service. The reason for this difference is that recreational travelers are generally more willing to pay a higher fee for a one-time trip, whereas commuter service fares must be low to attract riders to the service.

One opportunity to assist with local funding match for a demonstration service in Sarasota is the City's small trust fund for public transportation that has been created from development incentives. Developers in the downtown redevelopment and infill area are required to contribute financially into a trust fund for future public transportation improvements. The City is interested in starting a new trolley system to serve various residential developments and points of interest/activity, but has indicated that a water taxi system would be a potential funding option as well.

Private contributions from advertising, in-kind contributions and developer-incentives from other jurisdictions should also be considered as viable sources. In addition, the vessels could be made available for private charter or used for special events to generate additional revenue.

Fares for the service would most likely fall within the \$2 to \$5 range. For comparison, the Ft. Lauderdale water bus charges \$5 per day for unlimited rides. The fare should be set so that a reasonable amount of operating costs can be recovered relative to any public funding commitment for ongoing waterborne transit operations.

The fare structure can help create a more seamless system between water taxis and the existing public transportation system. Ft. Lauderdale's system allows patrons who purchase a 31-day or 7-day bus pass for Broward County Transit to use the same bus pass for the water bus system. Even though the Manatee Island Trolley is free, a similar system would help market and broaden access to other elements of the transit system.

## **IMPLEMENTATION ACTIONS**

Guidance from a public workshop in January 2005 suggested that a pilot program in the City of Sarasota should be initiated to demonstrate the potential value and feasibility of water taxi service in

the region. Although there are several viable service markets and potential routing options, the City of Sarasota has gone farthest among local governments in preparing for water taxi service by including water taxi service in its Comprehensive Plan, adopting an ordinance specifying minimum standards, and requiring docking facilities for waterfront redevelopment. The City has a funding mechanism in place for public transportation, a portion of which could be applied to water taxi service, depending on how such service is structured and linked via buses or trolleys. It is important that other local governments participate as well, particularly considering the regional nature of this concept and its applicability to other areas. The lessons learned from the demonstration project will be helpful to Venice, Manatee County and Bradenton Beach, among others.

There are several logical steps that should be followed to move from water taxis as a desirable concept to reality. First, from a state or federal grant funding perspective, it is important that the MPO endorse the feasibility of water taxi service and agree in principle to partner with the City of Sarasota on a demonstration project. Most grant funds for transportation go through the MPO, so the support of the MPO Board is imperative. The MPO would then need to include development of a water taxi system as part of its adopted Long Range Transportation Plan, preferably as part of the Financially Feasible list of projects based on reasonably available funding or specific funding commitments from one or more sources. Second, a more detailed Level II implementation plan is needed to define operations and design considerations, including specific routes and stops. The City of Sarasota has data to support this analysis. The MPO and City could partner on a more detailed implementation phase, but such a partnership is not necessary.

A more detailed implementation plan is needed to move the project forward. This can be a substantial undertaking, and would include estimating patronage, refining operating costs, defining terminals and vessel requirements, developing fares and the proper funding mix, and defining the process for private sector participation.

A grant application may be pursued either with the MPO as a partner or solely by the local government. Governance is an important consideration because of consistency of service and inter-jurisdictional connections. It is not necessary to have one system operated by a single regional entity or governmental oversight agency as long as interlocal agreements are in place regarding basic operations and minimum standards. However, a joint board or authority may be desirable if public transportation evolves in that direction and shared expenses/revenue becomes an issue.

## **SUMMARY AND CONCLUSIONS**

This report provides information that is intended to help frame the discussion of local stakeholders regarding the feasibility of initiating water taxi service in the Sarasota/Manatee region. What is considered feasible is ultimately a policy decision by local elected officials. The basis for that decision includes the estimated costs of operating the service, the plans for terminals or receiving areas where service would originate or reach a destination, the potential demand for service, and its ability to provide an alternative to other modes in congested areas.

Based on this analysis, it is recommended that the more feasible types of service in the two counties would focus primarily on the recreational market, rather than purely commuter-oriented service, and that service routing would link key destinations where travel time, comfort and convenience support the service. However, it is anticipated that direct and frequent recreational-oriented routes would also attract commuters who work at hotels, restaurants and other business locations in tourist or downtown districts.

Figure 3 shows recommended service areas, markets and priority hubs. The primary locations include the Manatee Riverfront (service across the river); the Manatee islands area, principally Bradenton Beach and Holmes Beach with connections to Cortez and possibly downtown Bradenton; downtown Sarasota (redevelopment of Quay, which is connected to an emerging arts and cultural district) with Mote Marine; and the Venice waterway with service from the Englewood area to the airport, Jetty Park and Nokomis Beach. This latter route is largely dependent on additional mixed-use development anticipated to occur at the airport, completion of the trail from the Venice Train Depot to Sarasota and continued redevelopment in the city's CRA. Finally, while an airport to Longboat Key connection is desirable and possible, more mixed-use development and commitment of supporting infrastructure is necessary to make this a feasible waterborne travel option.

If the MPO desires to move this initiative forward, next steps include incorporation of waterborne service into the MPO's 2030 Long Range Transportation Plan and working with the City of Sarasota to prepare a detailed operating plan to initiate service. Charter boat operators interested in partnering to help deliver water taxi service need to be invited to take an active role as stakeholders in developing the operating plan, developing vessel performance requirements, and participating in the process to decide how best to organize and govern the implementation of service from the pilot program to regular service.

Potential roles for government in this endeavor may vary considerably. In Broward County, the county owns the water bus system and leases it to a private operator for a renewable term to promote and operate the service. There is a hierarchy of several roles that one or more government entities can fulfill:

- Setting minimum standards for operation;
- Planning for service and securing facility space for docking, ticketing and parking;
- Subsidizing operations for desired service markets;
- Procuring vessels and contracting for operations through a Request for Proposals;
- Complete turnkey operations with government ownership and operations, much like public transportation is now run in both counties. This could entail some form of private contracting for one or more service functions.

Water taxi service is feasible as part of the transportation solution in the Sarasota/Manatee region if the MPO and its partners can ensure delivery of several essential factors. These include whether the service is adequately funded, routes are direct and positioned well to serve key destinations through careful land use/redevelopment planning and design with equal partnership from the private sector for operations, the service is aggressively marketed and promoted, and terminals are supported by an effective public transportation system operating at the same hours of service, and a connected sidewalk/bicycle network. Given the area's growth to more than one million people by 2030 and its resulting traffic congestion challenges, creative development of alternative travel options to expand choices available for all types of travel needs is an imperative closely linked with the region's continued economic vitality and mobility.

**Figure 3 – Recommended Routes and Priority Service Areas**

