

EXHIBIT A.

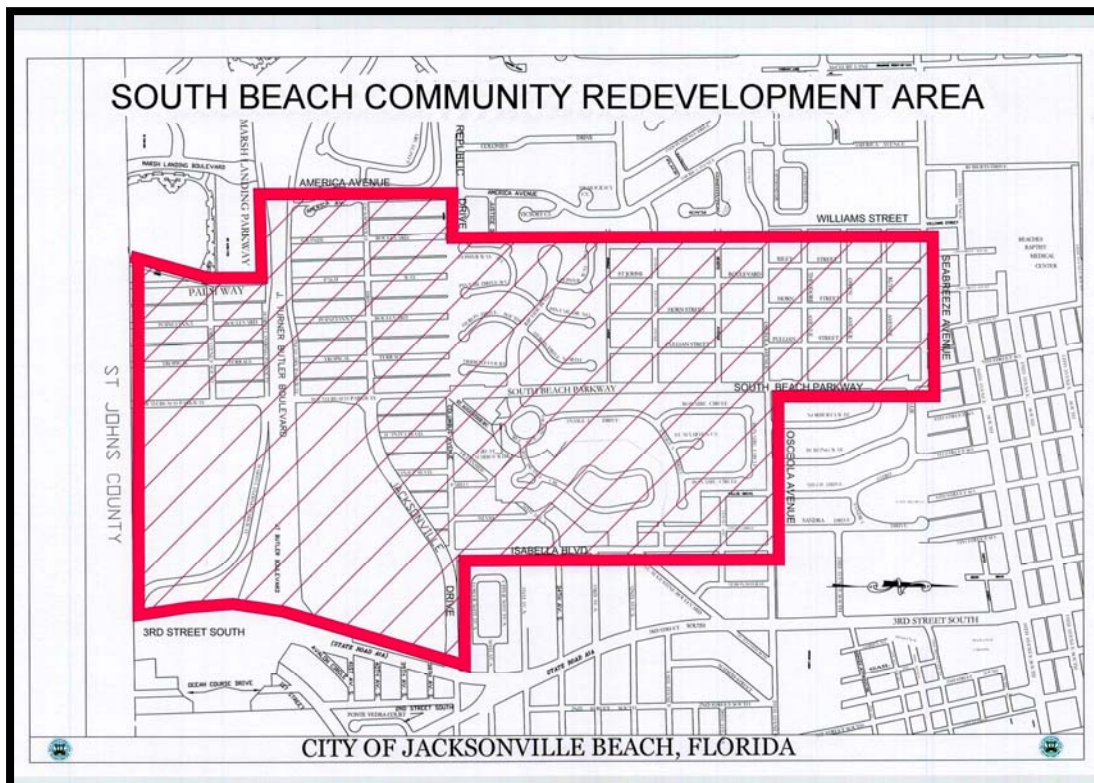
SOUTH BEACH COMMUNITY REDEVELOPMENT PLAN CAPITAL IMPROVEMENTS PROGRAM AMENDMENT

MARCH, 2011

BACKGROUND

On June 15, 1987, the City of Jacksonville Beach adopted its plan for the redevelopment of the South Beach area of the city. This action followed on the completion of a detailed study of physical conditions in the area and the approval of a resolution finding that a necessity exists for the redevelopment of the area. In August 1987, the City approved an ordinance establishing a tax increment trust fund for the South Beach Community Redevelopment District.

The map below shows the current boundaries of the District. Please note that the southeastern portion of the District along South 3rd Street adjacent to the St. Johns county line was added to the area by amending the redevelopment plan in May 1988.



Since its inception in 1987, the City and its Community Redevelopment Agency (CRA) has worked diligently to carry out the adopted plan. The effort has focused primarily on the provision of public infra-

structure to support the redevelopment of the area, both in support of public-private partnerships and as standalone capital improvements. In addition, four land assembly projects were successfully carried out using the City's eminent domain authority before the Constitution of the State of Florida was amended to limit this type of redevelopment activity. The table below lists the projects and the capital improvements or other assistance associated with each of them:

PROJECT	USE OF TIF FUNDS
Rip Tide Single Family Residential	Construction of South Beach Parkway (formerly Coastal Boulevard Highway) and Osceola Avenue; extension of water main and sewer trunk line in South Beach Parkway through the district to south of J. Turner Butler Boulevard; and storm drainage systems related to the roadwork, including construction of the Osceola regional pond
South Beach Regional Shopping Center	Land assembly assistance, construction of Jacksonville Drive from South 3 rd Street to South Beach Parkway, and related water, sewer, and storm drainage facilities
Ocean Cay Single Family Residential	Land assembly assistance
South Beach Parkway Shopping Center	Construction of Marsh Landing Parkway from South 3 rd Street to South Beach Parkway and related storm drainage system
Paradise Key Single Family Residential	Land assembly assistance and financial assistance for the construction of a drainage system serving the south end of the City and the development project
South Beach Mixed Commercial and Condominium Project	Land assembly assistance

Along with the private developments and public infrastructure associated with these six partnership agreements, the City and CRA have successfully implemented numerous standalone projects that have significantly enhanced the South Beach District and the City as a whole. Some of these projects are:

- Ocean Terrace Water and Sewer
- Williams Coastal Boulevard Heights Water, Sewer, and Street Paving
- Jacksonville Beach Heights Water, Sewer, and Street Paving
- South Beach Park (Multiple Phases)
- South Beach Fire Station #2 (Building and Site Development Only)
- South Beach Community Center and Exhibition Hall (Building and Site Development Only)
- South 9th Street/South Beach Parkway Roadway Improvements (with FDOT)
- Marsh Landing Parkway/South Beach Parkway Intersection Improvements
- Wastewater Treatment Plant Improvements
- South Beach Parkway Sidewalk (Jacksonville Drive to Butler Boulevard)

Capital improvement programming is an integral part of community redevelopment planning. In Florida, it is a basic tenet that a capital improvement project, whether contemplated as a part of a public-private partnership or as a standalone activity, must be allowed pursuant to the statute governing a CRA, and also be included in the adopted plan for the redevelopment district. As the South Beach District ap-

proaches the end of its 30-year life cycle, the City and CRA agreed that an in-depth study should be undertaken to determine what remains to be accomplished to ensure that area is stable and continues to thrive in the years beyond the existence of the tax increment trust fund.

1.0 EXECUTIVE SUMMARY

1.1 Introduction

In August 2008, the City of Jacksonville Beach Community Redevelopment Agency (CRA) retained the services of Waitz & Moye, Inc. (WMI), to undertake a comprehensive evaluation of the roadway and infrastructure improvements in the South Beach Redevelopment District. The South Beach Community Redevelopment District is generally bounded on the north by Seabreeze and Osceola Avenues, on the east by Third Street (A1A) and Isabella Boulevard, on the south by the St. Johns County Line and on the west by America Avenue, Merrill Boulevard and Williams Street.

The scope of services for this project included providing an Engineering Report for Infrastructure Improvements consisting of a stormwater master plan, and evaluation reports for water and sewer facility improvements. Underground and surface improvements will address roadway and right-of-way impacts. Locations for these improvements will be determined on a case-by-case basis as directed by CRA and City Public Works staff.

This is a summary of the full report which may be reviewed in the offices of the Jacksonville Beach Community Redevelopment Agency located in the Department of Planning and Development, City Hall, 11 North 3rd Street, Jacksonville Beach, FL 32250. The purpose of the report is as follows:

- Provide a the necessary research to serve as a basis to amend the Capital Improvements Program for the South Beach Community Redevelopment Plan
- Summarize the assumptions, evaluations, results and recommendations developed from modeling and analysis of the existing infrastructure components in the study area.
- Create a list of projects with an Engineer's Opinion of Probable Cost estimate and a phasing plan to expend the South Beach Community Redevelopment District's funds over the remaining life of the District.
- Evaluate the feasibility of creating a Drainage Master Plan combining the South and Central Basins to provide for stormwater credits for future City stormwater projects.

1.2 Water & Sewer System

All water distribution and sewer collection mains lying within the South Beach Community Redevelopment District were inventoried and a master plan depicting the existing line sizes and materials prepared. See section 2.5.2 of Appendices pages WS 1 through WS 16 in the full report for the water and sewer system inventory. The Appendices in the full report were compiled from records (as-builts, design drawings and J-Maps) that were obtained from the City of Jacksonville Beach's Public Works Department.

Requests were also sent to and comments were received from designated key City Operations/Maintenance personnel concerning problems or deficiencies that occur within the existing water distribution and sewer collection systems of the study area as well as at the Water Treatment Plant (WTP) #2, Well #23 sites, and the Lift Stations located in the project area. Field investigations were performed by WMI staff at these sites in order to ascertain problems and recommend solutions. Based on the results of the evaluation, the following improvements were recommended:

Water System:

- Improvements on different components of the Water Treatment Plant # 2
- Pump performance testing of the turbine pump located at Well # 23
- Replacement of existing 6” water main pipe located on Williams Street
- Replacement of existing 2” water main pipe located on Riley Street
- Replacement of existing 6” water main pipe located on Owen Avenue

Sewer System:

- Replacement of existing 8” sewer pipe located on Williams Street
- Replacement of existing 8” sewer pipe located on Ruth Street
- Replacement of existing 8” sewer pipe located on Seabreeze Avenue
- Replacement of existing 8” sewer pipe located on Riley Street
- Replacement of existing 8” sewer pipe located on Horn Street
- Phase out Lift Station #30 via 8” gravity sewer extension

Estimates of probable cost were prepared for each improvement. A detailed explanation of each of these improvements can be found in Section 2.0 of this report. It should be noted that not all of the recommended improvements are eligible for funding via the South Beach Community Redevelopment District Tax Increment Trust Fund (TIF). The various cost estimates show an initial determination if a project is eligible for funding by the CRA. In addition, any recommended project is subject to re-evaluation and modification during the detailed engineering and design phase of implementation.

1.3 Stormwater Piping Systems

WMI gathered all available “As-Built” information on the stormwater collection systems within the South Beach Community Redevelopment District. Using the City of Jacksonville Beach J-Maps, field inspection, and as-built drawings, WMI developed master stormwater drainage system maps for the area.

The existing South Beach drainage basin consists of both residential and commercial development varying in age. The heart of the drainage system for the South Beach Basin is the outfall ditch that flows from Osceola Avenue to J. Turner Butler Boulevard (JTB) and then westerly by way of a piped system to the South Basin De-siltation Canal located west of South Beach Parkway and south of JTB. This outfall collects runoff from the area north of Jacksonville Drive, east of Williams Street and Merrill Boulevard, west of 3rd Street South (A1A) and south of Seabreeze Avenue, and discharges into the Intracoastal Waterway.

The existing stormwater piping systems located in the South Beach Community Redevelopment District were inspected by WMI. The major systems and outfalls were evaluated using the “Hydraflow Storm Sewer 2003” modeling software. Based on the results of the evaluation, the following improvements were recommended:

- *William Coastal Boulevard Heights Area:* The existing swale system should be piped and connected to the existing piped system.

- *Ocean Terrace Area*: Acquire an easement and pipe the existing swale and connect to the existing piped system.
- *Jacksonville Beach Heights Area*: The existing swale system should be piped, connected to the existing piped system, and re-permitted.
- *South Beach Regional Shopping Center*: Install four (4) access manholes on the outfall system and construct a de-siltation area.
- *Osceola Avenue*: Improve the stormwater system by increasing the size of the existing pipes.
- *South Beach Parkway*: Construct stormwater system interconnections at South Beach Parkway and Rip Tide Boulevard.

Estimates of probable cost were prepared for each improvement. A detailed explanation of each of these improvements can be found in Section 3.0 of this report.

1.4 Stormwater Management

WMI gathered all available stormwater permits, plans and calculations for stormwater management systems within the South and Central Drainage Basins. WMI developed master permit maps and a spreadsheet incorporating all of the gathered information. Additionally, all of the permit data was archived on compact discs for future reference. Upon gathering all of the available information, WMI analyzed the permitted systems and developed recommendations for optimizing the City's stormwater facilities.

The entire City of Jacksonville Beach is divided into three major drainage basins – North, Central, and South. WMI's recommended approach to permitting the South and Central Basins is to place the entire basin under one permit. The sites that have provided their own Stormwater Maintenance Facility system should be removed from the basin's area for treatment requirements. Currently, the water is being treated twice, once by their on-site systems; and then again by the canal. By considering the areas that have their own treatment facilities as treatment credits, the required treatment volume for the basin could be reduced or used for future construction.

The existing South and Central drainage systems were modeled using the ICPR v3.1 software. The model routes stormwater through conveyance systems and identifies flooding conditions at each inlet. The model utilized the 5, 10 and 25 year storm design frequencies in order to meet the minimum level of service required by the City of Jacksonville Beach. Model results confirm that portions of the system are undersized and are in need of upgrades.

After gathering information on the City's stormwater management systems, WMI identified all public water bodies within the South and Central Drainage Basins that could be used as treatment credits for future City projects. Each one was evaluated in the present condition and, where feasible, modifications to these water bodies were proposed to increase the treatment credits available. Some of the proposed modifications were included in the ICPR model to verify the possible impact on the overall stormwater system. As a result, the following water bodies were recommended for improvements:

- Osceola Regional Pond
- Lake Mildred (New stormwater pump station is presently under design)
- South Basin De-siltation Canal
- South Beach Outfall Ditch

The treatment credits provided for these ponds should be used for public projects. Private projects should provide for their own “on-site” treatment system. This would allow the City to improve the infrastructure within the South Beach and Downtown Redevelopment Districts without constructing additional Storm Water Management Facilities (SWMF’s).

1.5 Reuse System Improvements

A Reuse Master Plan was prepared by Jones Edmunds & Associates, Inc. in February 2010 for the City of Jacksonville Beach. A portion of the proposed reuse system is located in the South Beach Community Redevelopment District. Additional reuse system improvements will have to be constructed to connect to these improvements. The proposed route of the reuse system includes:

- Seabreeze Avenue (Seabreeze Elementary School to 9th Street South)
- 9th Street South/South Beach Parkway (Seabreeze Avenue to JTB)
- South Beach Parkway (JTB to St. Johns County Line)
- Jacksonville Drive (South Beach Parkway to A1A)
- Osceola Avenue (South Beach Parkway to Sandra Drive)

1.6 Roadway Improvements

WMI inventoried existing conditions of all roadways within the South Beach Community Redevelopment District. After an internal record search was completed, each roadway within the area was inspected by a WMI representative. Based on the combination of record data and the inspections, a score was calculated for each roadway. The rating system, 1 through 10, was such that the lower the score the more severe/deteriorated the conditions. A score of 1.00 represents the worst possible road. A score of 10.00 would be an ideal street; streets that achieved this rating would have been recently constructed or in “like-new” condition.

For each roadway a proposed remediation scenario was assigned depending upon the type of road and the degree of deterioration. Six (6) options were identified including a “no action” alternative. These were labeled “A” through “F”. The options propose recommendations that range from complete reconstruction to various levels of rehabilitation. The majority of cases “routine” maintenance practices (i.e., activities within the capabilities of the City of Jacksonville Beach) should address the immediate concerns of residents.

Milling and resurfacing was recommended for the following roadways rated with “D” and “E”:

- Milling & Resurface: Jacksonville Drive from South Beach Parkway to A1A (3rd Street South)
- Milling & Resurface: Marsh Landing Parkway from Marsh Landing Boulevard to A1A (3rd Street South)
- Milling & Resurface: Sanctuary Parkway from Sanctuary Boulevard to South Beach Parkway (Work within Florida Department of Transportation right of way to be performed under state permit)
- Milling & Resurface: Williams Street from Seabreeze Avenue to Osceola Avenue
- Milling & Resurface: Isabella Boulevard from Jacksonville Drive to South of Osceola Avenue
- Milling & Resurface: 34th Avenue South (Burling Way) from Isabella Boulevard to Dead End

- Milling & Resurface: Jacksonville Drive from South Beach Parkway to Sanctuary Boulevard
- Milling & Resurface: Roadway depressions in Rip Tide Subdivision

In the South Beach Community Redevelopment District, there are some roadways that were originally improved for “Dust Control”. Core borings were taken to determine if the asphalt and the base course have sufficient thickness to support the current traffic conditions. It was determined from the borings that the following roadways do not meet the minimal thickness requirements, and it is recommended that the roads be reconstructed or modified so that their typical sections have adequate strength to support anticipated traffic loading:

- America Avenue – Jacksonville Drive to south of Republic Drive
- Riley Street – Theodore Avenue to Seabreeze Avenue
- Horn Street – Osceola Avenue to Seabreeze Avenue
- Grande Boulevard – Sanctuary Parkway to North End
- Palm Way – Sanctuary Parkway to North End

Estimates of probable cost were prepared for each improvement. A detailed explanation of each of these improvements can be found in Section 5.0 of this report.

1.7 Bike/Pedestrian Trail and Safety Improvements

WMI developed concept plans and Engineer’s Opinion of Probable Costs for the following enhancement projects:

- A possible bike/pedestrian trail along the drainage ditch along the east side of the Ocean Cay subdivision.
- Traffic safety improvements on South Beach Parkway between Jacksonville Drive and J. Turner Butler Boulevard.

The bike/pedestrian trail is proposed to be located along the east side of the South Basin Outfall Ditch from Osceola Avenue to the Paradise Key Subdivision. The trail will be an amenity to serve the residents of the City. This trail has two sections: the northerly section consists of approximately 1,300 feet of 10 foot wide asphalt trail designed using vehicular specifications. The 10 foot width accommodates multiple lanes of bike/pedestrian traffic, as well as City Maintenance or Police/Emergency vehicle traffic. A 1,000 foot section from the Northern section to the recreational park located in the Paradise Key Subdivision has a wider ditch, therefore we recommend that this section of trail be narrowed to 6 feet and designed using pedestrian specifications.

For the traffic safety improvements on South Beach Parkway between Jacksonville Drive and J. Turner Butler Boulevard various alternatives were investigated. Existing conditions such as underground and overhead utilities, drainage, signalization and adjacent development were considered. The most feasible alternative is to add a 12 foot wide lane on the west side of South Beach Parkway between Sanctuary Parkway and Jacksonville Drive. Our investigation also considered the future development of the parcel located west of South Beach Parkway. The location of the future driveway for the development was discussed with the City of Jacksonville Beach’s Planning and Development Department, and it was determined that the driveway would align with the existing South Beach Regional Shopping Center driveway located 150 feet north of Sanctuary Parkway. Two different concepts were developed. Concept A in-

cludes adding a 12-foot wide lane on the west side of South Beach Parkway, and Concept B was developed considering the future driveway and the need for future signalization. A traffic analysis of the proposed conditions was conducted, and it was determined that Concept B was the safest and most efficient operation. It requires relocating the existing traffic signal on South Beach Parkway at Sanctuary Parkway to the proposed commercial driveway.

1.8 3-Tiered Implementation Program

A tiered implementation program has been developed to include all of the proposed improvements detailed in this report. These improvements cover upgrades and replacement of water, sewer, stormwater facilities, and roadways within the South Beach Community Redevelopment District. Over the next six years, the Community Redevelopment Agency will have sufficient tax increment trust fund revenues to allocate the necessary funding to complete the recommended projects in this capital improvement plan for the District. Projects have been arranged in three tiers according need and importance. Refer to section 8.0 for detailed information regarding the availability of tax increment funds and the tiered phasing plan.

2.0 WATER AND SEWER SYSTEMS

2.1 Purpose and Objectives

Research and evaluate the existing water and sewer systems within the South Beach Redevelopment Area with the following objections:

- Inventory all of the existing water distribution and sewage collection systems lying within the South Beach Redevelopment District including pipe sizes and materials.
- Evaluate the existing condition of Water Treatment Plant (WTP) No. 2, Well No. 23 and sewer lift stations accepting sewage from within the study area.
- Identify all problem areas and recommend all necessary improvements.

2.2 Water System

2.2.1 Background

All water distribution mains lying within the South Beach Redevelopment District area were inventoried and a master plan depicting the existing line sizes and materials prepared. See section 2.5.2 Appendices pages WS 1 through WS 16 of the full report for water and sewer inventory. The Appendices were compiled from records (as built, design drawings and J-Maps) that were obtained from the City of Jacksonville Beach's Public Works Department.

Requests were also sent to and comments were received from designated key City Operations/Maintenance personnel concerning problems or deficiencies that occur within the existing water distribution system in the study area as well as at the WTP #2 and Well #23 sites. Field investigations were performed by Waitz & Moye, Inc. (WMI) staff at the WTP #2 and Well #23 sites in order to ascertain problems and recommend solutions.

The majority of the existing water distribution system located within the South Beach Redevelopment District was found to be comprised of polyvinyl chloride (PVC) pipe. However, isolated portions of galvanized steel, unlined cast iron, and cement lined ductile iron water pipes were found in service.

The Initial Capacity Analysis Report of the City of Jacksonville Beach Public Water System dated November 2005 by Applied Technology & Management, Inc. indicates that the treatment and supply services are adequate for the next ten (10) years. However, that report indicates the capacity deviation between Water Plant #1 and Water Plant #2 is the result of inadequate flows from Water Plant #2's well field.

Well #23's water production has decreased from 900 GPM to 600 GPM. The original well was drilled in the early 1980's. The deep well vertical turbine pump was originally installed in the early 1990's. There is no monitoring well for the south well field that would indicate non-site specific causes for the decline.

In WTP #2, the existing 440KW generator was originally installed in 1983. It is free standing and located in the southeast corner of the pump bay. Operation/maintenance personnel have work benches and perform routine maintenance on equipment in this same area. The generator does not have a sound at-

tenation enclosure surrounding it, and consequently produces excessive noise levels which pose a safety hazard to staff when in operation. The generator is mounted very low to the ground, as is the exhaust piping, and therefore, it is subject to flooding resulting from storm surges. Several temporary aluminum sheds are located on site for storage of various materials and equipment utilized in the day to day operation of the WTP. Excess supplies and equipment are also being stored in the pump bay. This causes unnecessary clutter, poses potential safety risks to staff, and restricts access to certain equipment. The Florida Department of Environmental Protection and the Department of Health have mentioned this clutter in their annual site visit reports. The chlorine storage facility is located on the north side of the WTP operations building. Although it is secured from entry, it is open aired to the atmosphere and could pose a health risk to the general public if a chlorine leak were to occur.

2.2.2 Recommendations

A complete and comprehensive hydraulic analysis of the City of Jacksonville Beach's water distribution system should be conducted in order to insure continuity of adequate pressures and supply to meet future and present maximum day, peak hour and fire flow demands.

The existing deep well vertical turbine pump at Well #23 should be tested by City maintenance/operations personnel or a private company, and the test results compared to the original factory pump performance curve. If the existing pump meets its factory performance requirements, then the existing deep well vertical turbine pump should be removed and a constant/variable rate test should be conducted on the well in order to determine the drawdown levels and specific yield of the well. If the test results reveal that the existing pump does not meet its factory performance requirements, the pump should be repaired or replaced. The St Johns River Water Management District required the construction of a monitoring well during the upgrades to Water Plant #1's raw water supply well field. The construction of a similar monitoring well for Water Plant #2's well field may be a requirement during future Consumptive Use permitting (CUP #793).

Recommended improvements at WTP #2:

- Install a marine grade aluminum or a level III stainless steel sound attenuation enclosure around the existing generator in order to suppress the noise.
- Install a support structure to raise the base of the existing generator a minimum of two (2) feet above the pump bay floor in order to prevent damage caused by flooding.
- Raise and reroute the existing muffler where the exhaust discharge is ten (10) feet above the pump bay floor to circumvent maintenance/operations personnel from being injured. An option would be to remove the existing generator from the pump bay or buy a new replacement generator and install it outdoors, adjacent to the existing fuel storage tank.
- Replace the existing temporary aluminum sheds with a new 40' (L) x 26' (W) x 18' (H) or 36' (L) X 36' (W) X 18' (H) maintenance/storage building. The new building should meet current building code requirements, and be designed to withstand hurricane force winds in order to safely store the maintenance supplies, miscellaneous equipment, and provide space to perform maintenance on equipment. The new building should be constructed from split face block or

block with a stucco coating, be provided with pre-stressed hollow core concrete roof panels w/membrane roofing material, a pan style aluminum mansard type parapet roof overhang, interior ventilation, a 5-ton motorized bridge crane, a motorized wind-rated overhead door, and an overhead inside storage decking over 1/3 of the interior. Building construction material and size may be adjusted based on final design.

- Modify the existing chlorine storage facilities to allow the installation of an emergency chlorine gas dry type scrubber similar to the one that is to be installed at the existing Pollution Control Plant. Modifications would include:
 1. The removal of the existing decorative open screen wall and replacement with closed cell CMU's.
 2. The removal of the existing double chain link gate and replacement with open topped, neoprene skirted, hollow core, flat panel anodized aluminum panel double doors.
 3. The installation of a fiberglass media containment vessel with a concrete base slab, blower assembly, external duct work, blower controls and other related miscellaneous appurtenances.

WMI recommends that all of existing galvanized steel and unlined cast iron water pipe eventually be replaced with new PVC (DR18) water pipe. The following list of water pipes to be replaced is based on the records (as built, design drawings and J-Maps) that were obtained from the City of Jacksonville Beach's Public Works Department. All recommended water main improvements are depicted on full report section 2.5.3 of Appendices in the full report.

- *Williams Street*: Replacement of 1,300 feet of existing 6" cast iron with 6" PVC water pipe and appurtenances from Osceola Avenue to Seabreeze Avenue.
- *Riley Street*: Removal of 200 feet of existing 2" galvanized and appurtenances from Owen Avenue to midblock between Owen Avenue and Ruth Avenue, and installation of 400 feet of 6" PVC pipe and appurtenances from Owen Avenue to Ruth Avenue with a fire hydrant at the intersection of Riley Street and Ruth Avenue.
- *Owen Avenue*: Replacement of 700 feet of existing 6" cast iron with 6" PVC water pipe and appurtenances from Williams Street to Horn Street.

Also, it is recommended that an evaluation be conducted along the existing 16" and 12" trunk water pipes that run south from WTP # 2 to Jacksonville Drive and north from Seabreeze Avenue. City records indicate that these pipes are ductile iron, and it is uncertain the status of the internal lining and external coating. If these are deteriorated or nonexistent, it is recommended that they be replaced.

2.3 Wastewater

2.3.1 Background

All the existing sewage collection mains lying within the South Beach Redevelopment District were inventoried and a master plan depicting existing line sizes and materials prepared. See section 2.5.2 of Appendices pages WS 1 through WS 16 for water and sewer inventory in the full report. The Appendix

was compiled from records (as-builts, design drawings and J-Maps) from the City of Jacksonville Beach Public Works Department.

Requests were sent and comments were received from City Operations/Maintenance personnel concerning problems or deficiencies that were or continue to occur within the existing sewage collection system as well as at the various contributing sewage lift station sites. Field investigations were performed by WMI staff at each of the sewage lift station sites in order to ascertain problems and recommend solutions. Also, videos of certain sewer pipes were taken to verify their current condition. The location of these pipes is depicted in section 2.5.5 of the Appendices in the full report along with the pipe inspection logs.

2.3.1.1 Gravity Collection System

The majority of the existing sewage collection system lying within the South Beach Redevelopment District was found to be comprised of polyvinyl chloride (PVC) pipe. However, isolated portions of vitrified clay and unlined cast iron sewer pipes were found in service within the South Beach Redevelopment District. In recent years, some of these sewer pipes have been replaced with PVC during roadway reconstruction projects.

According to City Operations/Maintenance personnel, during wet weather conditions, there are several sewer manholes that overflow into the roadway in the Paradise Key subdivision. During heavy downpours, resulting from torrential rain storms, the City's wastewater operations and maintenance personnel routinely allow the sewage collection system lying within the study area to become surcharged in order to help balance the influent flow to the City's WWTP. The Paradise Key sewer manhole where the sanitary sewer overflow occurs has the lowest top elevation of any manhole located within the overall study area.

In April/May of 2010, the existing poly-lined ductile iron gravity sewer trunk piping located along Seabreeze Avenue from 10th Street to South Beach Parkway and along South Beach Parkway from Seabreeze Avenue to Jacksonville Drive was relined with structural cured in place pipe (CIPP) liner.

2.3.1.2 Collection System – Lift Stations

As part of the sewer collection system, there are eight lift stations that accept sewage from within the study area or discharge into the gravity collection system located in the project area.

- **Lift Station No. 14:** The station is a quadruplex station with four Fairbanks-Morse pumps, each with a design capacity of 1,110 GPM at 40 feet TDH, located at 912 10th Street South, the City's Pollution Control Plant. This station collects effluent from Lift Station No's 17, 21, 24, 29, 30, and through other lift stations, from stations number 27 and 33. Lift Station No. 14 will be reconstructed and converted into a quadruplex master influent pumping station as part of the Wastewater Treatment Plant Improvement project. Therefore, no recommendations are included in this report.
- **Lift Station No. 17:** The station is a duplex submersible pump station with two Gorman-Rupp submersible pumps rated at 650 GPM at 66 feet TDH located at 3351 Anhinga Court. It dis-

charges to a manhole located on Osceola Avenue at Merrill Boulevard, and then flows by gravity to Lift Station number 14. The lift station has an 8-foot diameter wet well, which has been coated with Spectrashield and looks to be in reasonably good condition. The control cabinet seems to be deteriorated. Discharge piping is PVC with the exception of the discharge elbows, which are ductile or cast iron, and are showing some indication of rusting.

- **Lift Station No. 21:** The station is a duplex submersible pump station with two Myers submersible pumps, each rated for 160 GPM at 39 feet TDH, located at 4235-50 Marsh Landing Blvd. This station collects effluents from Ponte Vedra Lakes and Valencia subdivisions, and the Marsh Landing Retail Center. The force main from this station is manifolded with the force mains from lift stations number 25, 29, and 30; all discharging to a manhole on South Beach Parkway at Marsh Landing Parkway, and from there flows by gravity to Lift Station No. 14. This station seems to be in good condition. The wetwell was furnished with a fiberglass liner, and all piping is bitumastic coated. The fiberglass liner seems to be damaged by an influent pipe recently installed in the wetwell.
- **Lift Station No. 24:** The station is a submersible duplex station with two submersible Flygt pumps with a design pumping rate of 310 GPM, located at 3750 South 3rd Street. This station collects effluents from the South Beach Regional Shopping Center, Courtney South Beach subdivision, and areas along Isabella Boulevard and Burling Way. It discharges with a 6-inch force main to a manhole on Jacksonville Drive near the entrance to Paradise Key, and from there it flows by gravity to Lift Station No. 14. Some modifications were recently made when Home Depot acquired the adjacent property. Therefore, no recommendations are included in this report.
- **Lift Station No. 27:** The station is a duplex submersible pump station with two Myers pumps each rated for 118 GPM at 24 feet TDH, located at 3780 Sanctuary Way North. This station collects effluents from the south area of the Sanctuary subdivision and the area along Jacksonville Drive from Palm Way to America Avenue. It discharges to a manhole on Sanctuary Boulevard, where it then flows by gravity to Lift Station No. 17. The existing control panel, sewage pumps and motors are in a fair condition.
- **Lift Station No. 29:** The station is a duplex pump station furnished with Flygt submersible pumps rated for 500 GPM each, in an eight foot diameter wet well. This lift station is located at 396 Marsh Landing Parkway, behind the Target Shopping Store and McDonald's Restaurant. This station collects effluents from the South Beach Parkway Shopping Center. The force main from this station is manifolded with the force mains from Lift Station No. 21, 25, and 30, all discharging to a manhole on South Beach Parkway at Marsh Landing Parkway, and from there flows by gravity to lift station number 14. The station has been rehabilitated. Existing ductile iron piping in the wetwell was replaced with PVC piping. Existing Spectrashield coating system was repaired, and pump guide rails were modified to facilitate pump removal.
- **Lift Station No. 30:** This station is located at 4400 South Beach Parkway, close to the South Beach Parkway Shopping Center. This is a small duplex station of unknown capacity serving the Butler Substation.

- **Lift Station No. 33** is a duplex submersible station with two EMU pumps rated for 150 GPM at 13 feet TDH. This station collects effluents from Ocean Cay Phase II subdivision and the area along Isabella Boulevard from Osceola Avenue to 32nd Avenue South. It discharges via a 4" force main to a manhole on Isabella Boulevard at 33rd Avenue South, which then flows by gravity to lift station number 5. It appears the wetwell and the existing fence are deteriorated.

2.3.2 Recommendations

2.3.2.1 Gravity Collection System

All the existing vitrified clay gravity sewage collection piping should be replaced with new polyvinyl chloride PVC (SDR 35) pipe, slip lined with a cured in place pipe (CIPP) or pipe burst utilizing either a fused PVC pipe or a high density polyethylene (HDPE) pipe. The following list of sewer pipes to be replaced is based on the records (As Built, Design Drawings and J-Maps) that were obtained from the City of Jacksonville Beach's Public Works Department. All recommended sewer improvements are depicted in full report section 2.5.4 of Appendices.

- *Williams Street*: Replacement of 1,035 feet of existing 8" vitrified clay with 8" PVC sewer pipe and manholes from Osceola Avenue to Seabreeze Avenue.
- *Seabreeze Avenue*: Replacement of 750 feet of existing 8" vitrified clay with 8" PVC sewer pipe and manholes from Williams Street to 10th Street.
- *Riley Street*: Removal of 830 feet of existing 8" vitrified clay with 8" PVC sewer pipe and manholes from Theodore Avenue to Seabreeze Avenue.
- *Ruth Avenue*: Removal of 665 feet of existing 8" vitrified clay with 8" PVC sewer pipe and manholes from Riley Street to Pullian Street.
- *Horn Street*: Replacement of 670 feet of existing 8" vitrified clay with 8" PVC sewer pipe and manholes from Owen Avenue to Seabreeze Avenue.

In order to eliminate the flooding problem of several sewer manholes in the Paradise Key subdivision, WMI recommends that the City closely monitor the collection system to make sure that the collection system is only allowed to surcharge to within one foot of the lowest known manhole top elevation.

2.3.2.2 Collection System – Lift Stations

WMI has developed a series of recommendations for some of the lift stations within the project area using the comments from City Operations/Maintenance personnel and the data gathered from field investigation.

- *Lift Station No. 17*: Recommended improvements:
 1. Upgrade or replace the existing control cabinet.
 2. Install outside lighting without photocell on a 10-foot pole fed by a circuit breaker to be installed in the control panel.
 3. Replace or sandblast and paint the discharge elbows.
 4. Construct a new concrete access driveway over the existing ditch off of Anhinga Drive.

5. Relocate the existing chain link double access gate from the east side of the site to the west side of the site in order to accommodate the new access off of Anhinga Drive, and replace the existing wooden double gate off of Anhinga Drive with a new double wooden gate or chain link gate with PVC slats.
- *Lift Station No. 21:* The penetration from the recently installed influent pipe into the wetwell should be repaired by a private contractor that specializes in making fiberglass repairs.
 - *Lift Station No. 27:* Upgrade or replace the existing sewage pumps, motors and control panel.
 - *Lift Station No. 30:* Consideration should be given to phasing out this lift station by extending the 8-inch gravity sewage collection system located within the South Beach Regional Shopping Center directly behind Ace Hardware in a westerly direction across South Beach Parkway to the Beach Energy Services (BES) substation site.
 - *Lift Station No. 33:* Coat the existing wet-well with Spectrashield, and replace the existing fence.

2.4 Cost Estimate

A cost estimate has been done for each of the recommended improvements. Prices are based on recent project bids for the City and Florida Department of Transportation cost estimate. Also, costs of general items like mobilization, site preparation, maintenance of traffic, erosion control, and permitting could be reduced or eliminated if the City decides to combine projects located in the same area. Detailed cost estimates for each improvement are in appendix 2.5.1 of the full report.

2.4.1 Water System Improvements

LOCATION	PLANNING COST \$	SOURCE
Water Treatment Plant # 2 Improvements	\$310,257	CRA/CITY
Replacement of existing 6" water main pipe located on Williams Street	129,139	CRA
Replacement of existing 2" water main pipe located on Riley Street	72,899	CRA
Replacement of existing 6" water main pipe located on Owen Avenue	85,800	CRA
TOTAL	\$598,095	

2.4.2 Sewer System Improvements

LOCATION	PLANNING COST \$	SOURCE
Replacement of existing 8" sewer pipe located on Williams Street	\$175,499	CRA
Replacement of existing 8" sewer pipe located on Ruth Street	148,305	CRA
Replacement of existing 8" sewer pipe located on Seabreeze Avenue	156,417	CRA
Replacement of existing 8" sewer pipe located on Riley Street	163,254	CRA

LOCATION	PLANNING COST \$	SOURCE
Replacement of existing 8” sewer pipe located on Horn Street	120,592	CRA
Phase out Lift Station #30 via 8” gravity sewer extension – Beaches Energy substation and South Beach Parkway	50,455	CRA
TOTAL	\$814,522	

3.0 STORMWATER PIPING SYSTEM

3.1 Purpose and Objectives

Research and evaluate the existing drainage systems within the South Beach Drainage Basin with the following objectives:

- Inventory City of Jacksonville Beach owned stormwater piping and stormwater management facilities (SWMF), including the existing South Basin De-siltation Canal located south of Marsh Landing Parkway and west of South Beach Parkway.
- Identify problem areas and recommend improvements to reduce or eliminate the problems.
- Study the existing outfall in the Sandcastle Shopping Center to recommend locations for additional access structures.

3.2 Introduction

Waitz & Moye, Inc. (WMI) gathered all available public and private “As-Built” information on the stormwater collection systems within the South Beach Redevelopment District area. Using the City of Jacksonville Beach J-maps, field inspection, and “As-Built” drawings, WMI developed master stormwater drainage system maps for the area (see appendix 3.8.6 of the full report).

3.3 Background

The existing South Beach drainage basin consists of both residential and commercial development. The heart of the drainage system for the South Beach basin is the outfall ditch that runs from Osceola Avenue to J. Turner Butler Boulevard (JTB) and then westerly by way of a piped system to the South Basin De-siltation Canal. This outfall collects runoff from an area bordered on the south by Jacksonville Drive, west by Williams Street and Merrill Boulevard, east by 3rd Street South (A1A) and north by Seabreeze Avenue. Most of the South Beach Development District drains through this canal.

The South Beach drainage basin contains three major subdivisions that have on-site stormwater management facilities. The three are: *Rip Tide*, located west of South Beach Parkway and south of South Beach Park; *Ocean Cay*, located east of South Beach Parkway, and south of Osceola Avenue; and *Paradise Key*, located east of South Beach Parkway, north of Jacksonville Drive and south of the Ocean Cay Subdivision. The discharge for the Rip Tide subdivision flows into a separate stormwater main on South Beach Parkway which then discharges into the South Basin De-siltation Canal. The Ocean Cay and Paradise Key SWMF’s flow into the outfall ditch which then flow into the de-siltation canal.

3.4 Existing Conditions

The drainage systems within the South Beach basin vary in age from four years old to over 40 years old. Some of the older systems like Millie Drive and Sandra Drive, have been replaced and/or re-routed to improve the drainage in their area. Several roadways in the William Coastal Boulevard Heights area have been reconstructed or improved, which in some cases included improvements to the storm drainage systems. The following are brief descriptions of the South Basin drainage subsystems along with possible improvements.

3.4.1 Ocean Cay Subdivision

The Ocean Cay Subdivision was constructed in the latter part of 1997. This drainage collection system conveys the runoff from the lots and roadways to the interconnected onsite stormwater management facility for treatment. The discharge from these SWMF's is then directed east to the main outfall ditch which flows south into the de-siltation canal. The drainage system for this subdivision appears to be functioning as designed with no signs of localized flooding. There were no depressions over the drain lines within the subdivision which could indicate failures within the system except in the vicinity of #3034 Antigua Drive. This area has been repaired and the patch appears to be in good condition and shows no signs of settlement.

3.4.2 Rip Tide Subdivision

The Rip Tide Subdivision was constructed in the latter part of 1988. The collection system routes the runoff from the lots and roadways to the interconnected onsite stormwater management facility. The discharge from this subdivision originally tied into the former Coastal Boulevard drainage system which flowed north to Osceola Avenue and then east to the Osceola Avenue regional pond. In August 1994, a drainage project was constructed within Coastal Boulevard (currently named South Beach Parkway) to remove Rip Tide's discharge from the Osceola Avenue regional pond rerouting it southerly to the de-siltation canal by way of a 42" trunk line. This main trunk line serves only the discharge from Rip Tide and does not accept runoff from any other area.

WMI personnel observed that there is some roadway settlement over the interior drainage system within Rip Tide. The cross-drain on Zephyr Way North at Rip Tide Boulevard has several depressions in the roadway over the line which indicates that the pipe integrity may have been compromised. The original plans called for a concrete pipe at this location but when field investigated, our personnel observed that the pipe is PVC. Another location on Zephyr Way North near house number 3352 has a similar problem. There are depressions over the cross drain between the easterly curb inlet and the center of the roadway. The pipe appears to be the original concrete pipe which may have a joint problem at the connection point with the inlet. Two other locations on Zephyr Way South, at house numbers 1216 and 1258, have similar depressions on the roadways near the curb inlets (see Section 5.0 for more details). Both locations appear to have the original pipe and again the settlement may be from a joint/connection point leakage or poor compaction on the original installation. The remainder of the drainage system including the onsite SWMF's appear to be functioning as designed.

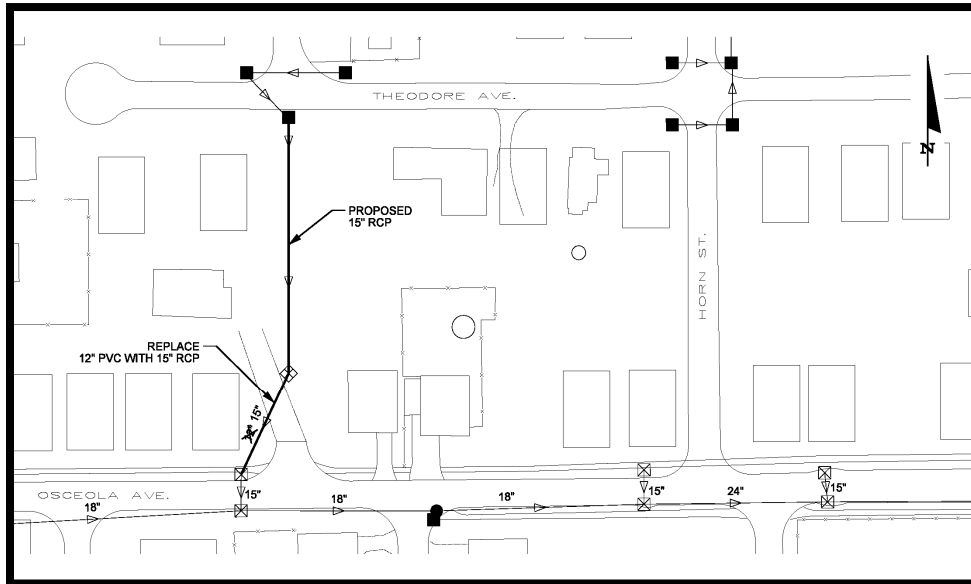
3.4.3 Paradise Key Subdivision

Paradise Key, constructed in 2006, is the newest subdivision in the South Basin. The project shows no visual problems on the pavement or the drainage system. All of the SWMF's appear to be functioning as designed. The discharge from this subdivision is directed to the outfall ditch and piped section just north of Jacksonville Drive.

3.4.4 William Coastal Boulevard Heights Area

This area is bounded by Williams Street on the west, Seabreeze Avenue on the north, South Beach Parkway on the east and Osceola Avenue on the south and has a mixture of old and relatively new roadways. In the older sections, the roadways are rural in nature and have little or no identified drainage systems. The newer roadways have "ribbon curb" with drainage swales and/or underground piped storm water conveyance systems. The drainage systems in this area have two outfalls. The first outfall is on Owen Avenue and ties into the South Beach Parkway system. The other outfall is located at the intersection of Theodore Avenue and Riley Street. This area flows to the south by way of piped and open ditch sections to Osceola Avenue just west of St. Johns Boulevard. City of Jacksonville Beach personnel report that the Theodore Avenue and Riley Street intersection floods during a normal rain. WMI personnel

investigated this area and discovered that the open ditch portion runs through a wooded area and is not well defined. In addition, the inlet area of the 12" pipe just north of Osceola Avenue is blocked by debris which adds to the flooding problem. WMI's recommendation for this area is to pipe the ditch between Theodore Avenue and Osceola Avenue and replace the existing 12" PVC pipe north of Osceola Avenue with a 15" concrete pipe to improve drainage in this area.



15" RCP INSTALLATION

A stormwater system along Williams Street from Seabreeze Avenue to Osceola Avenue discharges to the Osceola Avenue stormwater system at the intersection of Williams Street and Osceola Avenue. According to the drainage map for the 9th Street reconstruction project, which includes the South Beach Parkway and Osceola Avenue area, the drainage area for the stormwater system located along Williams Street was not included. Therefore, it appears that the stormwater system along Osceola Avenue could be undersized.

3.4.5 Hannah Terrace Area

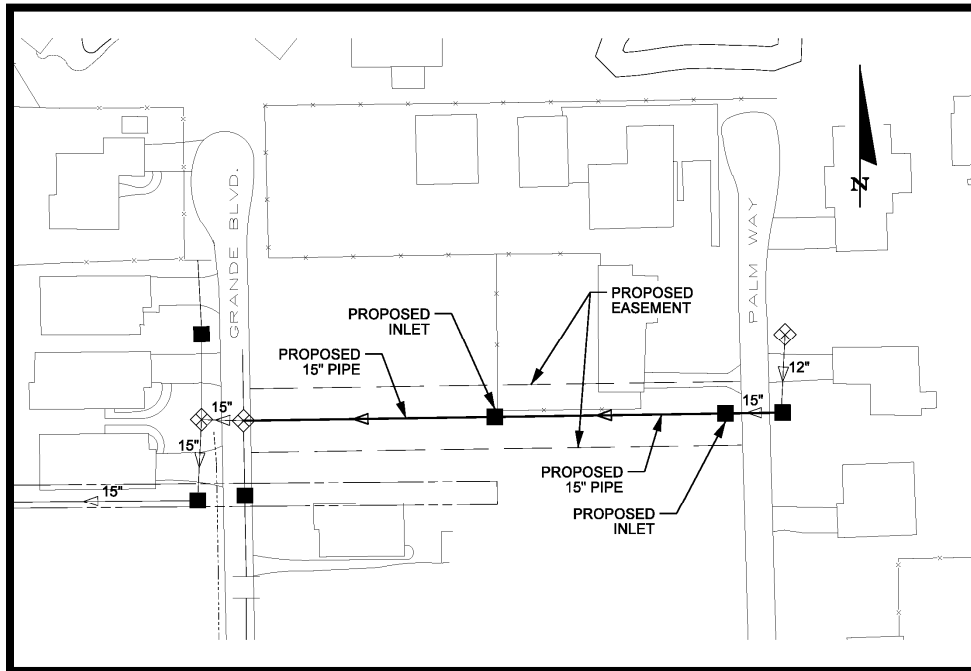
This area is not located in the South Beach Redevelopment District (SBRD) but, since a portion of this area is a contributing drainage area to the Osceola Avenue stormwater system, a brief description of this area has been included in this report. The roadways within this area are Norberta Way, Burling Way, Millie Drive and Sandra Drive. Norberta Way flows to the north, away from Osceola Avenue and is not contributing runoff to the South Beach Drainage Basin. At one time, the southerly parts of Millie Drive and Sandra Drive were connected to the Osceola Avenue regional pond by way of a piped system. However, this area has been redirected to the outfall ditch and bypasses the SWMF. Since these areas have been removed from the pond, which has a higher tail water elevation than the outfall ditch, the drainage systems have been improved. The runoff from the southerly part of Burling Way was connected to Millie Drive, but that pipe has been sealed and its drainage is now routed south to Osceola Avenue and is part of the Osceola Avenue Regional SWMF system.

3.4.6 Ocean Terrace Area

This area is bounded by J. Turner Butler Boulevard (JTB) on the south, South Beach Parkway on the east, Rip Tide Subdivision on the north and America Avenue on the west. The majority of the roadways

in this area have rural sections with little or no drainage systems. The two roadways that have urban sections are Sanctuary Parkway and a section of America Avenue south of Jacksonville Drive.

The portions of America Avenue, Grande Boulevard and Palm Way lying north of Jacksonville Drive, flow to the west by way of cross drains and open swales to the Sanctuary’s SWMF system. Palm Way flows to Grande Boulevard through a swale located south of house number 3902 Palm Way and north of house number 3851 Grande Boulevard, north of Jacksonville Drive. There is not currently a drainage easement for this swale. WMI recommends obtaining an easement and piping the swale to minimize the maintenance.



15” RCP INSTALLATION AND DRAINAGE EASEMENT

Poinciana Boulevard and Tropical Terrace, which are north of Jacksonville Drive, have piped storm water collection systems that flow to the east and tie into the roadway drainage system of South Beach Parkway. This portion of South Beach Parkway flows to the south into the SWMF south of J. Turner Butler Boulevard (JTB) and east of South Beach Parkway. This SWMF discharges into the box culvert which flows into the South Beach De-siltation Canal.

America Avenue is an urban section and the drainage flows west to the Sanctuary’s SWMF system. Grande Boulevard and Palm Way between Sanctuary Parkway and Jacksonville Drive have rural sections without any notable drainage systems. Jacksonville Drive appears to flow over land both east towards South Beach Parkway and west towards the Sanctuary subdivision. Sanctuary Parkway is an urban section and its drainage system flows to the west and discharges into Lake Sanctuary thru the Sanctuary Subdivision to an open ditch to the Intracoastal Waterway. WMI personnel found only one problem on America Avenue; a broken sidewalk approximately 270 feet north of Jacksonville Drive over a PVC cross drain due to poor compaction around the pipe. (See Section 3.10.2.4 of the full report)

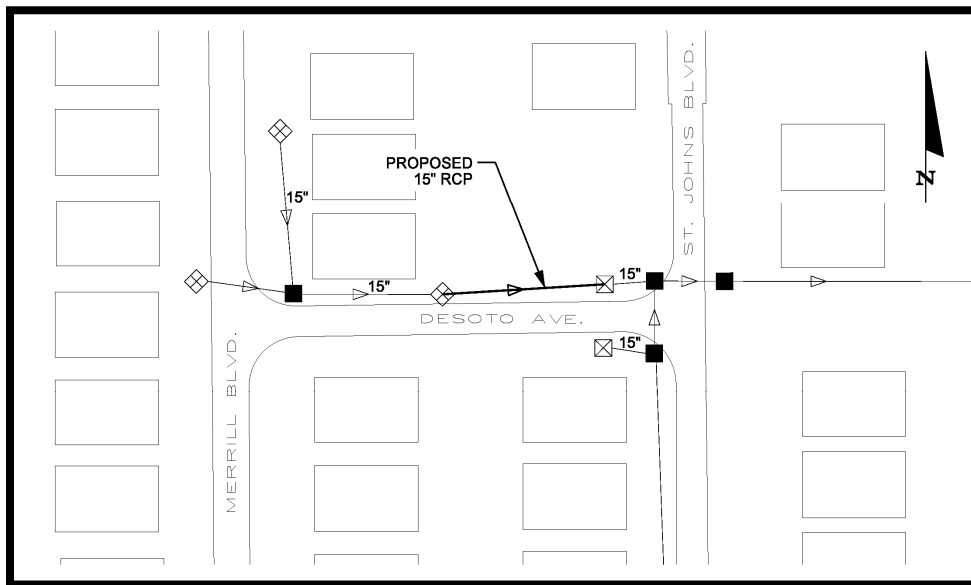
3.4.7 Jacksonville Beach Heights Area

This area is bounded by Rip Tide Subdivision on the south, South Beach Parkway on the east, Osceola Avenue on the north and Merrill Boulevard on the west. All of the drainage in this area eventually con-

nects to the South Beach Parkway drainage system which flows into the Osceola Avenue Regional Pond.

The South Beach Park area flows into the park's SWMF before discharging into the South Beach Parkway's system. The new roadways south of the park: Ponce De Leon Avenue, Horn Court, Pullian Court, and Sunshine Court, all flow into the South Beach Parkway's system. The roadways south of the park have Miami curb and gutter with a piped drainage system.

Merrill Boulevard, St. Johns Boulevard, and the westerly portion of Ponce De Leon between Merrill Boulevard and St. Johns Boulevard all flow directly into the South Beach Parkway's system. Originally, this area was designed with roadside and rear yard swales that discharged in a stormwater pipe system located along Desoto Street. During a field inspection, WMI personnel observed that some of the roadside swales have been piped or filled, and some of the rear swales appear to be filled. Also, the roadside swale located south of Lot 8 along Desoto Street is full of debris blocking the drainage from Merrill Boulevard. WMI recommends piping this yard swale to eliminate drainage problems in this area. In addition, this modification should be permitted as part of the Master Permit. The swale system was a permitted storm water treatment system and any modification to the swale will require a permit modification or should be included in another permit.



15" RCP INSTALLATION

3.4.8 South Beach Regional Shopping Center Area

This shopping center was built in 1990. The construction included the installation of two 72" concrete pipes to canalize the South Beach outfall ditch that runs from Osceola Avenue to J. Turner Butler (JTB) and then westerly by way of a piped system to the de-siltation canal. The two pipes are approximately 950 feet long and are located in an 80-foot wide City drainage easement. No manholes were found along these pipes. WMI personnel inspected the culvert inlet and outlet on December 17, 2009 and observed approximately 12 inches of siltation in the pipes. This amount of siltation reduces the hydraulic capacity of these pipes.

In addition to regular maintenance of these culverts, WMI recommends the installation of two manholes or structures along each pipe to facilitate maintenance. Additionally, the installation of a small de-siltation pond upstream of the two 72" concrete pipes should reduce future maintenance problems on the

area by reducing the sediment to the ditch before it enters the pipes. The City has enough drainage easement in the area to build a 40' x 80' de-siltation pond. Also, since this area is close to Jacksonville Drive, a vacuum truck parked on Jacksonville Drive could remove the sediment accumulated without disturbing the Paradise Key neighborhood. The location and details of the proposed manholes and de-siltation pond are shown on the next page.

3.5 Stormwater Modeling

Osceola Avenue/South Beach Parkway Drainage System

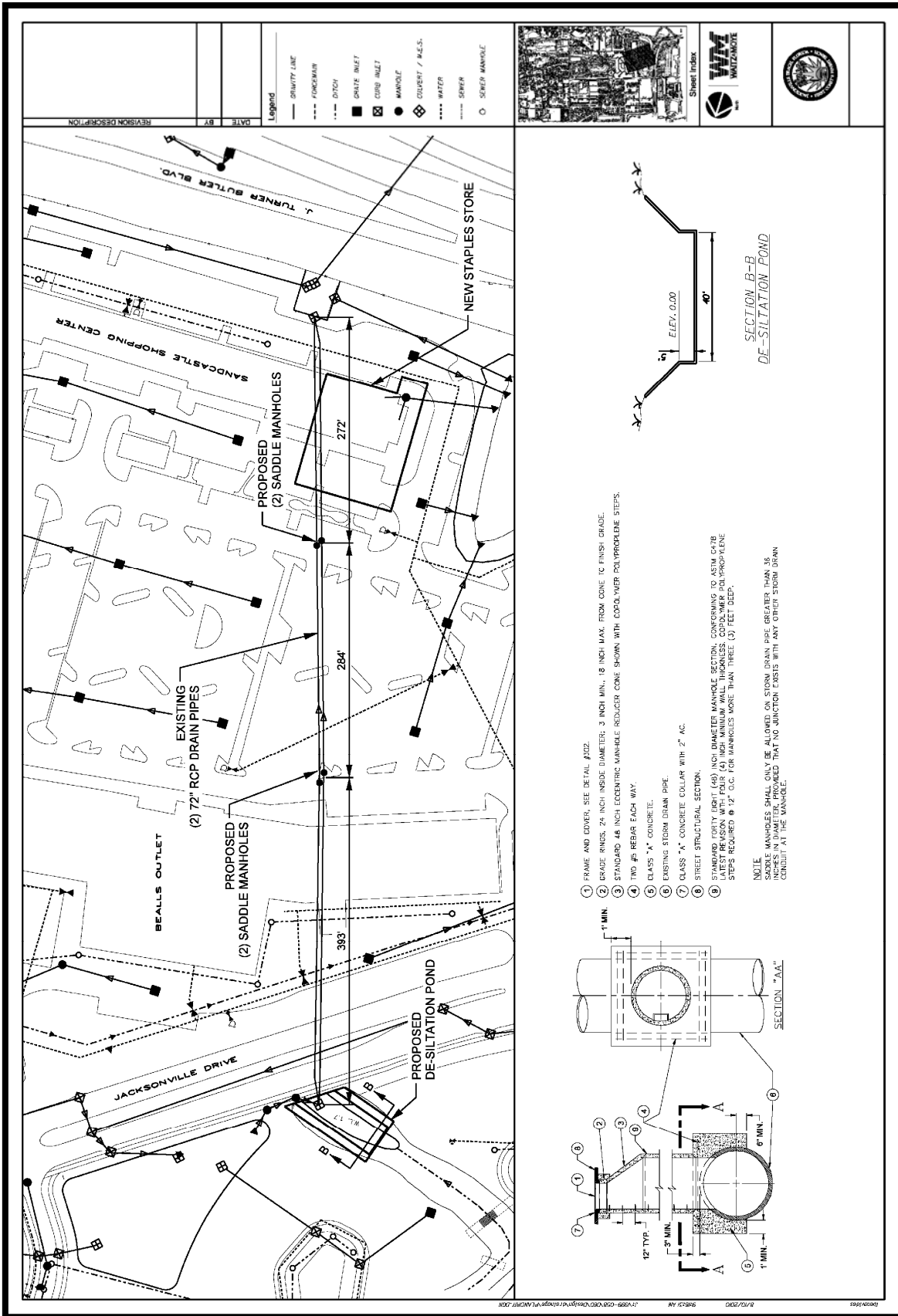
The interconnecting drainage system on Osceola Avenue and South Beach Parkway was originally designed and constructed for the runoff from the roadway improvements and offsite adjacent property. The two drainage systems are interconnected at the intersection of the two roadways and then flow east to the Osceola Regional SWMF which is located south of Osceola Avenue and east of the Ocean Cay subdivision. The SWMF's water level is controlled by a weir system that maintains a normal water level of 4.50 with a weir treatment elevation of 6.50. The SWMF has a top of bank elevation of 10.00 and a bottom elevation of -4.0.

Since the time of the original construction, drainage areas have been added to the upstream portion of the system (see existing condition description for William on section 3.4.4) which were not included in designing the pipe sizes for the system. Also, some areas north of Osceola Avenue have been removed from the pond's drainage basin and are now connected directly into the outfall ditch (see existing condition description on section 3.4.5). In addition, the Rip Tide Subdivision's drainage area was removed from the Osceola Avenue Regional SWMF drainage basin by rerouting it southerly to the South Beach De-siltation Canal by way of a new 42" trunk line.

As a result, it was necessary to update the system model.

The system was modeled using the following criteria:

- A) The existing storm sewer must meet the minimum level of service (10 year frequency storm) required by the City of Jacksonville Beach.
- B) Utilize FDOT Rainfall Intensity vs. Duration curve for Duval County.
- C) Set the tail water elevation of the system according to the results of the ICPR model for 5 year storm event (See ICPR Model results in Section 4.0).
- D) Utilize Hydraulflow Storm Sewers 2003 to analyze the storm sewer systems, which uses the rational method for the analysis.

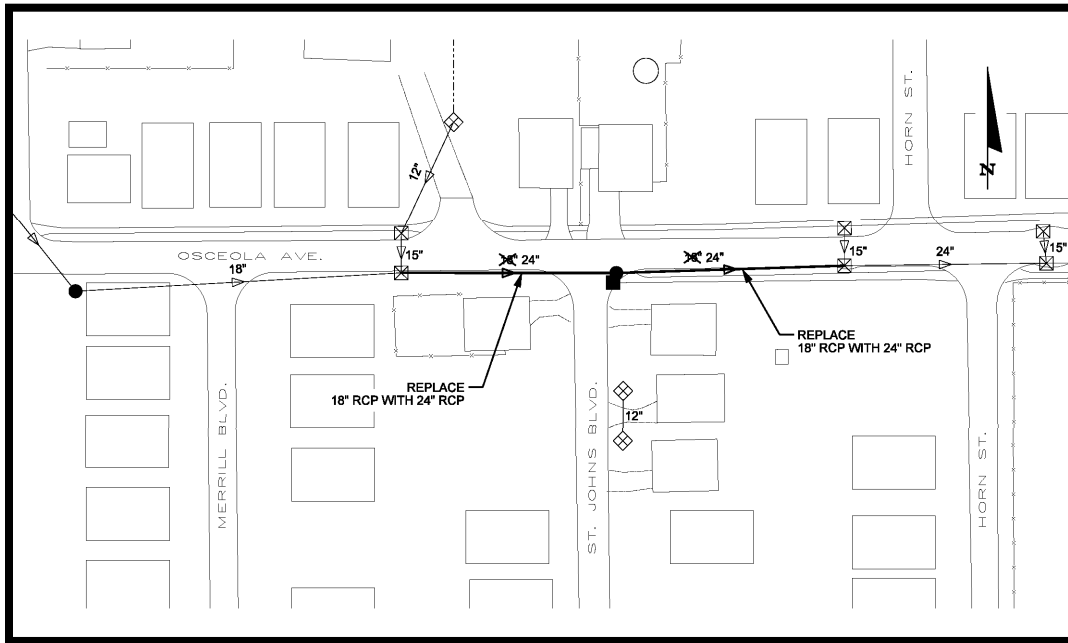


The Hydraflow Storm Sewers 2003 model estimates the conveyance capacity of the storm sewer pipes for the design storm. The conveyance capacity of a pipe depends directly on its diameter, roughness, and slope. The model results show the elevation of the hydraulic grade line at the inlet or manhole. Where the hydraulic grade is lower than the structure top means there is no flooding whereas a hydraulic grade elevation above the structure top means there is flooding. The model results are provided in the appendix 3.8.4 for existing conditions.

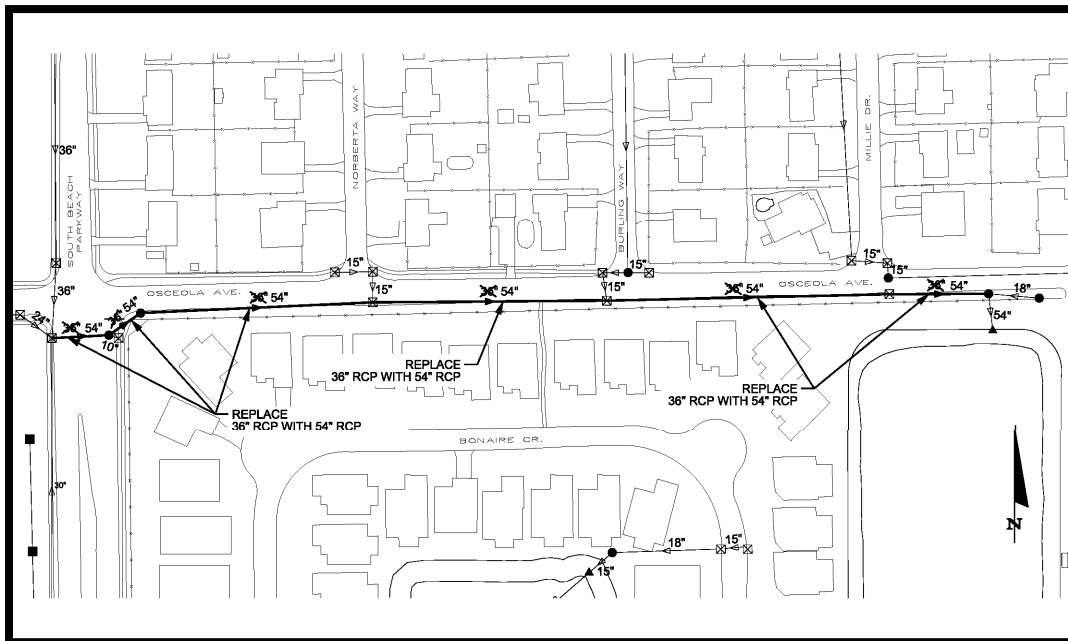
The Central and South Drainage Basins were modeled as existing today using the ICPR v3.1 software (See ICPR Model in Section 4.5). The model shows the high water elevation for a 5 year storm event on the Osceola Avenue Regional SWMF is 8.45 feet (see appendix 4.9.3.4, node *Osceola Pond*). This elevation was used as the tail-water elevation for the drainage system on Osceola Avenue and South Beach Parkway. The existing drainage system on Osceola Avenue and South Beach Parkway was then modeled with the Hydraflow Storm Sewers 2003 program using a 10-year storm event. The results show that the stormwater system of Osceola Avenue and South Beach Parkway is undersized and needs upgrades to meet the 10-year storm event criterion.

As part of the evaluation of the drainage system, some alternative improvements were evaluated to upgrade the stormwater system:

1. Lower the normal water elevation of the Osceola Avenue Regional SWMF to reduce the tail-water elevation of the stormwater system. This option includes the modification of the Osceola Avenue Regional SWMF's control structure. Since it is expected that there would be a strong opposition by the Ocean Cay Homeowners Association to lowering the normal water level of the pond, this option was discarded.
2. Replace the existing 36" concrete pipes located along Osceola Avenue between the Osceola Regional SWMF to the intersection with South Beach Parkway with 54" concrete pipes. The modeled results show the stormwater system along South Beach Parkway between the Rip Tide Subdivision and Osceola Avenue meets the 10-year storm event criterion (see appendix 3.8.5). However, the stormwater systems along Osceola Avenue between Williams Street and South Beach Parkway are undersized. Upsizing the existing 18" concrete pipes located along Osceola Avenue between Merrill Boulevard and Horn Street would fix the problem in this area. The stormwater system along South Beach Parkway between 16th Avenue South and Osceola Avenue is currently under construction by an FDOT design/build contract. Therefore, no further investigation was performed to evaluate upgrades to this portion of the stormwater system.



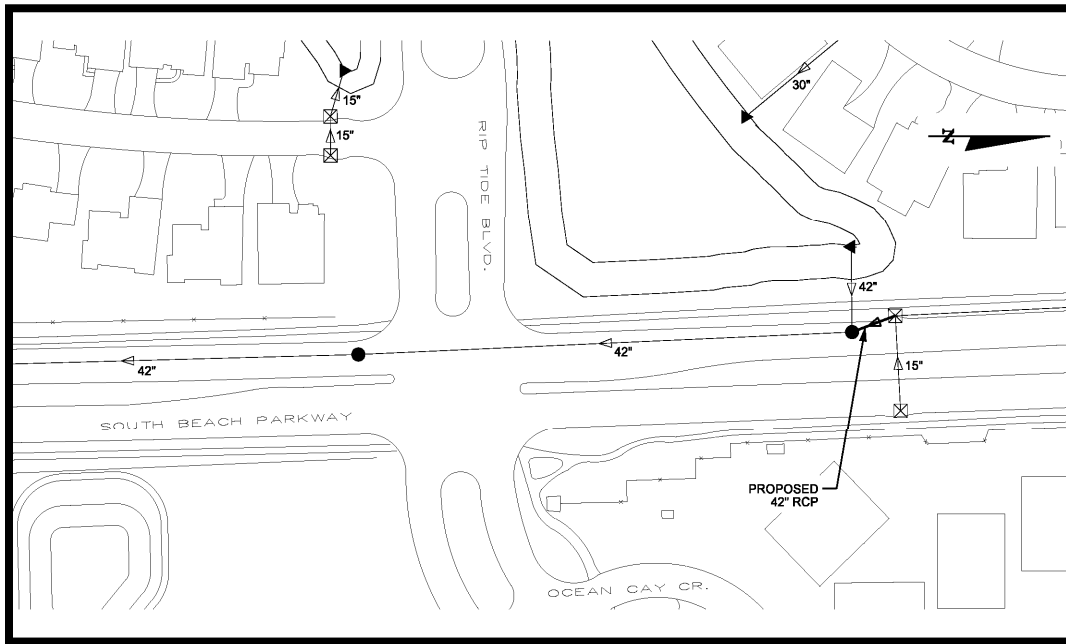
18" RCP REPLACEMENT



36" RCP REPLACEMENT

3. Extend the existing 42" concrete pipe located along South Beach Parkway in front of Rip Tide Subdivision to the existing 30" concrete pipe in order to divert a portion of the flow from the Jacksonville Beach Heights area to the South Basin de-siltation SWMF. This improvement will allow a direct connection to the Osceola stormwater system to the South Basin de-siltation pond, reducing the potential flooding problems along the South Beach Parkway area. This connection was simulated for 5 and 10 year storm event using the ICPR model (see appendix 4.9.3.9 nodes C296, C300 and C302). The results show a reduction of around 2 feet in the hydraulic grade line

(HGL) along the South Beach Parkway stormwater system between Rip Tide Subdivision and Osceola Avenue with no effect on the Rip Tide Subdivision pond system.



42" RCP EXTENSION

3.6 Permit Requirements/Storm Frequencies

The City of Jacksonville Beach Design Criteria will require a 10-year 24-hour storm analysis for stormwater conveyance pipe systems. Applicable sections of the City's code are presented on section 3.8.1.

A St. Johns River Water Management District (SJRWMD) Permit will be required for some of the modifications to the existing systems. Water quality standards and discharge requirements will need to be met. WMI's approach to permitting the South and Central Basins would be to place the entire basins under one permit (see section 4.6). This would allow including permits required for all the improvements recommended in this report in one permit.

An FDOT Drainage Connection Permit will be required for any modifications to the FDOT drainage systems and thus requires compliance with FDOT Rule 14-86. These rules state that connections to the FDOT drainage facilities shall not increase the rate of runoff to the facility for any design storm. The FDOT requires the determination of the critical duration storm which means determining pre- and post-discharge rates for various storm frequencies of various durations.

3.7 Recommended Improvements

3.7.1 Design Guidelines

The following Design Standards are recommended for the design of the storm sewer systems and grading:

1. Storm sewer system shall be designed (to City of Jacksonville Beach Standards) for a 10-year/24-hour (7.68 inches/24-hour) frequency design storm using the rational method and shall

include all minor energy losses for entrance, exit, junction and manhole, expansion, contraction and bends. (Design Criteria may include FDOT Drainage Connection Permit Requirements.)

2. Minimum time of concentration shall be 10 minutes on the roadways and 20 minutes for residential areas.
3. The drainage system should be designed in order that the Hydraulic gradient does not reach the gutter elevation since minor energy losses are included in the computations.
4. Minimum physical pipe slopes shall be such that they will produce a self-cleaning velocity of 2.5 feet per second when flowing full.

Water Management System Design Standards

1. St. Johns River Water Management District permitting rules for water quality and discharge will be met.
2. Temporary erosion control measures shall be placed prior to construction of any project and they shall remain in good working condition throughout its duration.

3.7.2 Cost Estimate

A planning cost estimate has been done for each recommended improvement. Prices are based on recent project bids for the City and FDOT estimate costs. Where applicable, the estimates include SJWMD permit fees. These fees should be removed from the cost estimates if the City decides to proceed with one permit (see section 4.6). Also, if some of these projects are combined, the cost of general items like mobilization, site preparation, maintenance of traffic, erosion control, and permitting could be reduced or eliminated. Detailed cost estimates for each improvement are in appendix 3.8.2. of the full report.

IMPROVEMENT	PLANNING COSTS \$	SOURCE
William Coastal Boulevard Heights Area: Pipe existing swale and connect to existing piped system.	\$74,117	CRA
Ocean Terrace Area: Pipe existing swale, connect to existing piped system, and acquire drainage easement.	180,355	CRA
Jacksonville Beach Heights Area: Pipe existing swale, connect to existing piped system, and re-permit through the SJRWMD.	45,375	CRA
South Beach Regional Shopping Center: Manhole installation and De-siltation pond construction	237,994	CRA
Osceola Avenue: Stormwater System Improvements	636,752	CRA
South Beach Parkway: Stormwater System Interconnection	87,753	CRA
TOTAL	\$1,262,346	

4.0 STORMWATER MANAGEMENT SYSTEM EVALUATION

4.1 Purpose and Objectives

Research and evaluate storm water management systems within the South and Central Drainage Basins to accomplish the following objectives:

- Prepare a study/Master Plan for the South and Central Drainage Basins and development of computer models of the stormwater systems.
- Study/Master Plan includes computer models interconnecting the two drainage basins.
- Prepare a concept for a Master Stormwater Permit for the combined basins.

4.2 Introduction

WMI gathered all available stormwater permits, plans and calculations for stormwater management systems within the South and Central Drainage Basins. Using the acquired data, WMI developed master permit maps and a spreadsheet incorporating all of the gathered information (see appendix 4.9.1 of the full report). Additionally, all of the permit data was archived on compact discs for future reference. Using the gathered information, WMI analyzed the permitted systems and developed recommendations for optimizing the City's stormwater facilities.

4.3 Methodology

The existing Central and South Beach drainage basins consist of residential and commercial developments that vary in age. The developments in the South Basin ultimately discharge into the large de-siltation canal located west of South Beach Parkway and south of J. Turner Butler Boulevard (JTB). The Central Basin discharges into the 12th Avenue South system. Many projects have on-site treatment facilities and are treating their runoff before entering the de-siltation canals. Additionally, the South and Central Basins are interconnected but have never been documented in previous permits.

WMI recommends permitting the South and Central Basins under one permit. The sites that have their own SMWF system should be removed from the total basin area when calculating treatment requirements. In essence, obtain credit for water that is being treated twice, once by on-site systems and then again by the canal. By considering the areas that have their treatment facilities as treatment credits, the required treatment volume for the basin is reduced.

WMI identified all public water bodies within the South and Central Drainage Basins which could be used to obtain treatment credits for future City projects. The City has several existing ponds that have the capacity to provided stormwater treatment, but have never been used in previous permits. Each of the systems was evaluated in the present condition and, where feasible, proposed modifications in these water bodies were evaluated which would increase the treatment credits available. In some cases these proposed modifications were modeled to verify the impact to the overall stormwater system (See section 4.5).

4.4 Water Bodies

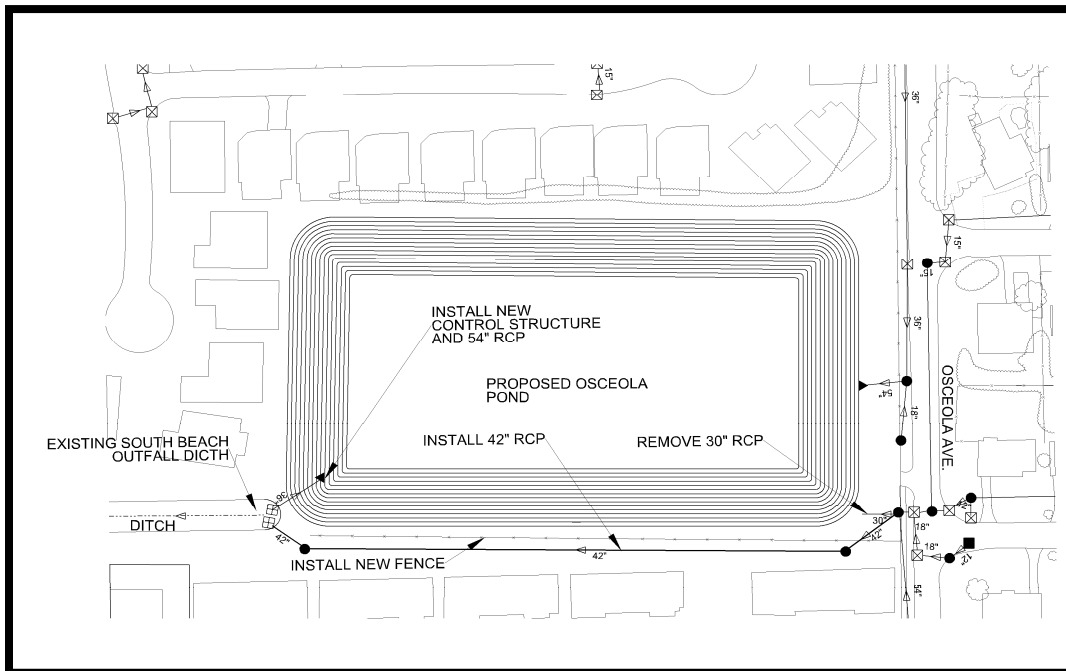
4.4.1 Osceola Regional Storm Water Management Facility (SWMF)

The Osceola regional pond was constructed in 1989 as part of the reconstruction of Coastal Boulevard (now known as South Beach Parkway) and Osceola Avenue. The SWMF's water level is controlled by a weir that maintains a normal water level of 4.50 mean sea level (msl) with a treatment (weir) elevation of 6.50 msl. The SWMF has a top of bank elevation of 10.00 msl and a bottom elevation of -4.00 msl. Since the SWMF was constructed, changes in the tributary basin area have occurred (see section 3.5), and the modifications to the SJRWMD SWMF regulations have occurred. The calculations show the SWMF does not have sufficient treatment volume to meet the SJRWMD's current SWMF requirements (see calculation in section 4.8.2.1 of the full report).

WMI proposes to expand Osceola Avenue regional pond. The SWMF can be expanded to encompass the area of the existing outfall ditch by piping the existing outfall (see figure below). This improvement requires removing the existing SWMF control structure and spillway and building a new control structure at the southeast corner of the facility to maintain the same normal water elevation of 4.5 feet msl.

The existing conditions and proposed modifications were introduced in the ICPR model. The results show a reduction of the SWMF high water elevation for the 5, 10 and 25 year storm event with no significant impact on other components of the stormwater system (see appendix 4.8.3.5 of the full report).

Expanding the Osceola regional pond would increase the stormwater treatment credits available and allow for approximately 5.24 acres of additional impervious area. See "Stormwater Treatment Calculations" on section 4.8.2.1 of the full report. In addition, it would reduce the amount of surcharge in the collection system thereby improving the function of the system and reducing the amount of sediment build up within the system.



OSCEOLA POND MODIFICATIONS

4.4.3 South Basin De-siltation Canal

The South Basin de-siltation canal is a wet-detention SWMF located west of South Beach Parkway and south of J. Turner Butler Boulevard (JTB). This Canal was built in 1994-1995 as part of a major improvement project for the South Basin drainage area. The primary function of the SWMF is to act as a sediment trap. Additionally, the de-siltation SWMF provides treatment volume and permanent pool volume. The normal water elevation (NWL) of the SWMF is controlled by two (2) electrically operated gates and two 3" bleed-down pipes which are set to maintain a NWL elevation of 2.0 feet msl. The water treatment elevation is controlled by a 60 foot wide concrete weir. According to the wet detention calculations in Section 4.8.2.4 of the full report, the pond provides stormwater treatment for approximately 19.58 acres of impervious area. This treatment was never assigned to any construction project.

WMI proposes to lower the normal water elevation in the de-siltation canal by 2 feet. This will provide additional stormwater treatment credits for approximately thirty-seven (37) acres of impervious area. See "Stormwater Treatment Calculations" on section 4.8.2.3 of the full report. Since the two (2) gates inverts are -0.25 feet, it appears that they are able to control the proposed normal water elevation. Modifications in the electrical control system of these pumps and the level detection system will be necessary, and will be determined in the design phase. Work to also include: installation of level controls; safety catwalk at weir; sampling platform and access; and debris collection and removal system.

The existing conditions and proposed modifications were incorporated in the ICPR model. The results show a reduction in the pond high water elevation for the 5, 10 and 25-year storm event with no significant impact on other components of the stormwater system (see section 4.8.3.7 of the Full report). This will also reduce the amount of surcharge in the collection system thus improving the function of the system and reducing the amount of sediment.

4.4.5 South Beach Outfall Ditch

The South Beach Outfall Ditch is the heart of the drainage system for the South Beach basin. This ditch flows from Osceola Avenue to J. Turner Butler Boulevard (JTB) and then westerly by way of a piped system to the South Basin De-siltation Canal. This outfall collects runoff from the area north of Jacksonville Drive, east of Williams Street and Merrill Boulevard, west of 3rd Street South (A1A) and south of Seabreeze Avenue.

WMI proposes to include the South Beach outfall ditch as part of the treatment system. The outfall ditch is controlled by the South Basin De-siltation Canal. Due to the flow characteristics of the outfall ditch, it serves as part of the treatment capabilities for the de-siltation facility.

The treatment benefits of the outfall ditch have never been included in any permit. By evaluating the outfall and determining the treatment volume that it provides, it is possible to increase stormwater treatment credits for approximately fifty (50) acres of impervious area if the normal water level (NWL) of the South Basin De-siltation Canal is set to elevation 0.00. (See "Stormwater Treatment Calculations" in section 4.8.2.5 of the full report).

If the NWL is kept as its existing 2 feet, the stormwater treatment credits will be approximately twenty five (25) acres. These credits can be used by the City for future roadway improvement projects. The same modifications to the control structure in the South Basin De-siltation Canal as explained in section 4.4.3 are necessary to accomplish this improvement.

4.5 ICPR Model

Existing storm drainage conditions were modeled using the ICPR v3.1 software. This model includes the collection systems and all main SWMF's located in the area. The model utilizes 5, 10 and 25-year storm design frequencies to detect potential flooding problems in the area.

The model includes the Central Basin ending at the Intracoastal Waterway, and the South Basin ending at the De-siltation Canal. The tailwater elevations used in the model are based on the drainage studied for the South and Central basins under the SJRWMD permit # 4-031-17821-1 and #4-031-17821-2

According to the ICPR model, the following areas within the South Beach Redevelopment District appear to have flooding problems under 10 and 25-year/24-hour storm design frequencies. The same locations appear to have potential flooding problems during a 5 year storm design frequency.

- Along South Beach Parkway in front of South Beach Park.
- Along Osceola Avenue in front of Osceola Avenue Regional Pond.

The potential flooding problems along South Beach Parkway and Osceola Avenue were addressed in section 3.5 of this report. After modeling the existing conditions, some of the modifications proposed in section 4.4 were included in the model to verify the impact in the whole system. Please refer to the appendices in section 4.8.3 of the full report.

4.6 St Johns River Water Management District (SJRWMD) Permit Evaluation

As part of our evaluation of the Central and South drainage basins, WMI researched all the current St. Johns River Water Management District (SJRWMD) permits to determine which sites contained their own treatment facilities and which ones utilized the Central Basin De-siltation Canal, the South Basin De-siltation Canal, the Golf Course pond system or the Osceola Avenue Regional Pond for treatment. The permit data has been compiled on two spreadsheets and maps labeled "Central Basin" and "South Basin". The permit maps provide a visual location of the permitted projects with colors to show which sites have on-site treatment systems and which ones utilized off-site treatment. The maps also provide a location of the "wet ponds" and the basin boundary lines.

The Central Drainage Basin map includes the Downtown Redevelopment drainage permit limits as established by Reynolds, Smith & Hills and the new Downtown Redevelopment drainage permit limits as established by the City. The Central Basin map also identifies the recently-completed North 2nd Street project. This drainage project included installation of another pump system located at 2nd Street North and 9th Avenue North which directs the collected runoff to the existing drainage vault under Beach Boulevard. The limits of the drainage basin for this project are from 6th Avenue North to 13th Avenue North, between 3rd Street North and the Ocean. The collected runoff will then be pumped to the Golf Course pond system for treatment.

The SJWMD permit obtained by Reynolds, Smith & Hills for the Downtown Redevelopment proposes that if new projects in this area exceed the 80 percent impervious limit then the site must provide "on-site" treatment for the difference.

The treatment credits provided in the ponds analyzed in section 4.4 and compiled in the table below should only be used by City projects. Private projects should be required to provide their own "on-site" treatment system.

Location	Maximum Impervious Area to be Treated Under Existing Pond Configuration (AC)	Maximum Impervious Area to be Treated Under Proposed Pond Configuration (AC)	Additional Impervious Area to be Treated
LOCATED IN THE SOUTH BEACH REDEVELOPMENT DISTRICT			
Osceola Regional Pond	23.47	28.71	5.24
South Basin De-siltation Canal	19.58	37.06	17.47
South Beach Outfall Ditch	0	50.0	50.00
LOCATED OUTSIDE OF THE SOUTH BEACH REDEVELOPMENT DISTRICT			
Huguenot Park Ponds	0	36.0	36.00
Central Basin De-siltation Canal	26.88	48.58	21.70
Golf Course Ponds	0	59.0	59.00
TOTAL	69.93	259.35	189.42

In addition to the above noted proposed improvements shown in section 4.4, WMI proposes to permit the Central and South Drainage Basins as one drainage basin under one permit. Since the two basins are already interconnected at 3rd Street South (A1A) and Osceola Avenue, they can be considered as one basin. A SJRWMD permit will be required for modifications to the existing systems.

The proposed Master Stormwater Management system will meet design and permit requirements to provide stormwater treatment credits that can be used for future projects. A Drainage Connection Permit will be required for any modifications to the FDOT drainage systems and thus requires compliance with FDOT Rule 14-86.

4.7 Cost Estimate

A planning cost estimate has been developed for each recommended improvement. Prices are based on previous projects for the City and FDOT.

LOCATION	PLANNING COSTS \$	SOURCE
Osceola Regional Pond Modifications	\$511,966	CRA
South Basin De-siltation Canal Modifications	420,900	CRA
Central and South Basin SJRWMD Permit	41,700	CRA/CITY
TOTAL	\$974,566	

ROADWAY IMPROVEMENTS

5.1 Purpose and Objective

Research and evaluate the roadways within the South Basin to obtain the following objectives:

- Inventory the existing conditions of all roadways within the South Beach Redevelopment District (SBRD) area.
- Identify all problem areas and recommend all necessary improvements.

5.2 Introduction

Waitz & Moye, Inc. (WMI) has evaluated the condition of the existing surface components within the SBRD including: parking facilities, roadway pavement, sidewalk, and curb.

5.2 Evaluation Strategy

The initial step in the Roadway Evaluation process was to identify and assemble pertinent roadway data. To make a comprehensive assessment of the streets it was necessary to incorporate information regarding the visible and subsurface components that make-up the “roadway system”. For each component, a list of technical criteria was developed that described various levels of deterioration, each was assigned a numerical value. The intent was to provide generic descriptions that could be used to compare overall conditions to usage. Certain components carry more importance because they apply to a roadway’s structural integrity, and were assigned higher values. The technical criteria for evaluating the relative condition of the various roadway sections are discussed in detail in the full report.

After the record search was completed, each roadway within the area was inspected. Values were assigned and an overall rating was calculated for each roadway component. Using an average of the weighted scores, a final score was calculated for each roadway. **The rating system was such that the lower the score the more severe/deteriorated are the conditions.** A score of 1.00 represents the worst condition. A score of 10.00 would be a street in perfect condition; streets given this rating were recently constructed or in “like-new” condition. A complete inventory of all roadway scores is presented in Section 5.13.2 of the Appendices in the full report.

For each roadway, a proposed remediation scenario was assigned. Six (6) options were identified which included a “no action” alternative. These were labeled “A” through “F”. The options range from complete reconstruction to various levels of rehabilitation. In the majority of cases, “routine” maintenance practices (i.e., activities within the capabilities of the City of Jacksonville Beach) should address the immediate concerns identified in this document.

Since some of the roadways are within an identified subdivision. For example, in Rip Tide, Ocean Cay, and Paradise Key, the roadways within each subdivision were constructed at approximately the same time, and therefore, their roadway ratings are approximately the same with only minor differences. These roadways have been grouped together in the report.

5.4 Rating Pavement Surface Condition

With an understanding of surface distress, it is possible to evaluate and rate asphalt pavement surfaces. The rating scale ranges from 10 – excellent condition to 1 – failed. Most pavements will deteriorate through the phases listed in the rating scale. The time it takes to go from excellent condition (10) to complete failure (1) depends largely on the quality of the original construction and the amount of heavy traffic loading.

Once significant deterioration begins, it is common to see pavement decline rapidly. This is usually due to a combination of loading and the effects of additional moisture. As pavement ages and additional cracking develops, more moisture can enter the pavement and accelerate the rate of deterioration.

5.4.1 Relation between Rating and Maintenance

Rating 9-10	No maintenance required
Rating 8	Little or no maintenance
Rating 6-7	Routine maintenance, crack-sealing and minor patching
Rating 5	Preservative treatments (seal-coating)
Rating 3-4	Structural improvement and leveling (overlay or recycling)
Rating 1-2	Reconstruction

In addition to indicating the surface condition of a road, a given rating also includes a recommendation for needed maintenance or repair. This feature of the rating system facilitates its use and enhances its value as a tool in ongoing road maintenance.

5.4.2 Rating system

SURFACE RATING	CLASSIFICATION	VISIBLE DISTRESS	GENERAL CONDITION/ TREATMENT MEASURES
10	Excellent	None	New construction
9	Excellent	None	Recent overly. Like new.
8	Very Good	No longitudinal crack except reflection of paving joints. Occasional transverse cracks, widely spaced (40' or greater). All cracks sealed or tight (open less than 1/4").	Very good.
7	Good	Very slight or no raveling, surface shows some traffic wear. Longitudinal cracks (open 1/4") due to reflection or paving joints. Transverse cracks (open 1/4") spaced 10' or more apart, little or slight crack raveling. No patching or very few patches in excellent condition.	First signs of aging. Maintain with routine crack filling.
6	Good	Slight raveling (loss of fines) and traffic wear. Longitudinal cracks (open 1/4"– 1/2") some spaced less than 10'. First sign of block	Shows signs of aging. Sound structural condition. Could extend life with seal-coat.

SURFACE RATING	CLASSIFICATION	VISIBLE DISTRESS	GENERAL CONDITION/TREATMENT MEASURES
		cracking. Slight to moderate flushing or polishing. Occasional patching in good condition.	
5	Fair	Moderate to severe raveling (loss of fine and coarse aggregate). Longitudinal and transverse cracks (open 1/2") show first signs of slight raveling and secondary cracks. First signs of longitudinal cracks near pavement edge. Block cracking up to 50% of surface. Extensive to severe flushing or polishing. Some patching or edge wedging in good condition.	Surface aging. Sound structural condition. Needs seal-coat or thin non-structural overlay (less than 2")
4	Poor	Severe surface raveling. Multiple longitudinal and transverse cracking with slight raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (1/2" deep or less).	Significant aging and first signs of need for strengthening. Would benefit from a structural overlay (2" or more).
3	Very Poor	Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (1" or 2" deep). Occasional potholes.	Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay.
2	Critical	Alligator cracking (over 25% of surface). Severe distortions (over 2" deep). Extensive patching in poor condition. Potholes.	Severe deterioration. Needs reconstruction with extensive base repair. Pulverization of old pavement is effective.
1	Failed	Severe distress with extensive loss of surface integrity.	Failed. Needs total reconstruction.

Examples of the Rating System that was used with photos are included in the full report.

5.5 Averaging and comparing sections

For evaluation purposes, the local road system was divided into individual segments which are similar in construction and condition. Rural segments may vary from a half mile to a mile long, while sections in urban areas will likely be 1-4 blocks long or more. Obviously, no roadway segment is entirely consistent. Also, surfaces in one section will not have all of the types of distress listed for any particular rating. They may have only one or two types. Therefore, some averaging is necessary. The objective is to rate the condition that represents the majority of the roadway. The overall purpose of condition rating is to be able to compare each segment relative to all the other segments in the roadway system. On completion it

should be able to look at any two pavement segments and find that the better surface has a higher rating. Having all pavement segments rated in the proper relative order is most important and useful.

5.6 Assessing drainage conditions

Moisture and poor pavement drainage are significant factors in pavement deterioration. Some assessment of drainage conditions during pavement rating is highly recommended. While drainage should be reviewed in detail at the project level, at this stage it simply includes an overview drainage evaluation at the same time as the surface condition is evaluated.

The drainage system within the South Beach Basin seems to be in good condition. Combined with the majority of the roadways having curb and gutter, an on-site stormwater management facility and a low ground water table provides for an excellent drainage system for the area.

5.7 Summary

Using local road funds most efficiently requires good planning and accurate identification of appropriate rehabilitation projects. Assessing roadway conditions is an essential first step in this process. Using an asphalt pavement surface condition rating procedure can prove effective in improving decision making and using highway funds more efficiently. It can be used directly by local officials and staff. It may be combined with additional testing and data collection in a more comprehensive pavement management system.

5.8 Proposed Remediation Options

Based upon the overall condition of each roadway, a remediation option was assigned that would address the identified defects. The selection of a rehabilitation plan was based upon engineering judgment and relevant technical experience.

5.8.1 Remediation Code

- A.** No action proposed at this time.
- B.** Little or no maintenance is required. Occasional transverse cracks, widely spaced, no longitudinal cracks.
- C.** Longitudinal and transverse cracking, no patching or very few patches in excellent condition.
- D.** Longitudinal and transverse cracking, occasional patching in good condition. Slight to moderate flushing or polishing.
- E.** Moderate to severe raveling (loss of coarse aggregate), longitudinal cracking in wheel path, transverse cracking and first signs of block cracking, extensive to severe flushing and polishing.

- F. Severe raveling, multiple longitudinal and transverse cracking, block cracking, moderate rutting in wheel path area. Some alligator cracking.

Tables R19 and R20 in section 5.12.1 of the appendices in the full report show the assigned rating per road segment.

5.8.2 Identification of Streets

For easy reference, we have listed below the roadways in each noted subdivision.

5.8.2.1 Ocean Cay Subdivision

ROADWAY SEGMENT	SCORE	CODE
Bonaire Circle (Antigua-Antigua)	8	B
St. Maarten Court (Antigua-North end)	8	B
Antigua Drive (Ocean Cay Circle-Northeasterly end)	8	B
Bay Island Circle (Ocean Cay Circle-Bay Island Circle)	8	B
Great Abaco Court (Bay Island Circle-Bay Island Circle)	8	B
Ocean Cay Circle (Rip Tide Blvd-Rip Tide Blvd)	8	A
Rip Tide Boulevard (South Beach Parkway-Ocean Cay Cir)	8	A

The roadways within the Ocean Cay subdivision have not been resurfaced or overlaid with a seal-coat. The existing asphalt is in good condition with minor stress cracks and settlement around most of the sewer manholes. There is one roadway repair area near a drainage inlet on Antigua Drive, which is in good condition. The only problem areas are on Bonaire Circle near the house #798 and on Bay Island Circle near the house #3538. There are depressions in the roadway over the sewer line which may indicate a joint problem on the line. This has been addressed on the Water/Sewer portion of this report. No drainage problems were noted.

5.8.2.2 Paradise Key Subdivision

ROADWAY SEGMENT	SCORE	CODE
Paradise Way (Jacksonville Drive-Royal Palm Key)	10	A
Royal Palm Key (Marathon Key-Northerly end)	10	A
Marathon Key (Paradise Way-South end)	10	A
Grassey Key (Royal Palm Key-Coconut Key)	10	A
Coconut Key (Grassey Key- East end)	10	A

All of the roadways in this subdivision are new and no problems exist.

5.8.2.3 Rip Tide Subdivision

ROADWAY SEGMENT	SCORE	CODE
Pin Tail Drive N (Rip Tide-North end)	8	B
Heron Drive N (Rip Tide-North end)	8	B
Zephyr Way N (Rip Tide-Northwesterly end)	7	C

Zephyr Way S (Rip Tide-Southwesterly end)	7	C
Pin Tail Dr S (Rip Tide-South end)	7	C
Heron Drive S (Rip Tide-South end)	7	C
Trident Court (Rip Tide-South end)	7	C
Rip Tide Boulevard (South Beach Parkway-West end)	6	C

Rip Tide Subdivision is an older section and all the roadways have had a 1/4” to 3/8” thick seal-coat applied to their surface. In heavy traffic usage areas, like the main entrance and in the cul-de-sacs, the seal-coat has worn off or has been torn up and repaired. Prior to the seal-coat application, the existing roadways had some pavement degrading due to the age and traffic volume. The pavement had stress cracks and blocking areas mainly on the entrance roadway. These problems have since worked their way through the seal-coat and will become a maintenance issue. There are several areas within the Rip Tide area that had depressions over a drain line or near a drainage inlet. One area of concern is at the intersection of Zephyr Way North and Rip Tide Boulevard where the shallow plastic drain line appears to be the cause. The other depressions near the drainage inlets are shown in the following pictures.

5.8.2.4 Roadways in the Jacksonville Drive area, west of South Beach Parkway

ROADWAY SEGMENT	SCORE	CODE
America Avenue (Jacksonville Drive-Republic Drive)	6	C
Grande Boulevard (Sanctuary Parkway-North end)	6	C
Palm Way (Jacksonville Drive-North end)	6	C
Palm Way (Sanctuary Parkway-Jacksonville Dr)	10	A
Poinciana Boulevard (Jacksonville Drive-North end)	8	B
Jacksonville Dr (America Avenue-South Beach Parkway)	6	C
Sanctuary Parkway (Sanctuary Blvd-South Beach Parkway)	5	C
America Avenue (Jacksonville Drive-South end)	8	B
Tropical Terrace (Jacksonville Drive-North end)	8	B

America Avenue (north of Jacksonville Drive), Grande Avenue, Palm Way, Poinciana Boulevard, and Jacksonville Drive are all rural in nature with similar roadway conditions. All but Palm Way between Sanctuary Parkway and Jacksonville Drive and Sanctuary Parkway, have been seal-coated but the stress and age cracks are showing through the coating. The overall condition of the roadways is “good” with the exception of Palm Way (Sanctuary Parkway to Jacksonville Drive) being listed as “excellent”. The portion of America Avenue south of Jacksonville Drive is an urban section and is listed in “very good” condition. Sanctuary Parkway is heavily traveled and is in “good” condition.

The heaviest traveled of these roadways are America Avenue north of Jacksonville Drive and Jacksonville Drive, and both are showing signs of that heavy use. America Avenue has three cut repairs on the section north of Jacksonville Drive caused by utility work or drain pipe installation/repair. In one location, as shown in one of the photos, the sidewalk is damaged and needs to be repaired.

5.8.2.5 Roadways in the area north of Osceola Avenue, west of South Beach Parkway, south of Seabreeze Avenue and east of Williams Street

ROADWAY SEGMENT	SCORE	CODE
Owen Avenue (Riley St-150' east of Horn Street)	10	A
Horn Street (60' north of Owen Avenue-Osceola Avenue)	10	A
Pullian Street (Owen Avenue-Osceola Avenue)	10	A
Theodore Avenue (West of Riley Street-South Beach Parkway)	10	A
Osceola Avenue (Williams Street-South Beach Parkway)	9	A
Seabreeze Avenue (Williams Street-Pullian Street)	7	C
Ruth Avenue (Williams Street-South Beach Parkway)	7	C
Owen Avenue (170' west of Pullian Street-South Beach Parkway)	7	C
Horn Street (Seabreeze Avenue-60' north of Owen Avenue)	7	C
Pullian Street (Seabreeze Avenue-Owen Avenue)	7	C
Riley Street (Seabreeze Avenue-50' north of Theodore Avenue)	6	C
Williams Street (Seabreeze Avenue-Osceola Avenue)	5	D

The roadways with “10’s” in this section have been rebuilt with ribbon curb and require no improvements. Osceola Avenue which receives a large traffic volume has been recently resurfaced and has a rating of “9”. This rating will change if the existing underground utilities have not been upgraded which might cause settlement or the existing asphalt surface had imperfections which were not addressed. Until then, the roadway will be rated “excellent”. The remaining roadways in this section except for Williams St are rural in nature and have been seal-coated. The stress cracks and pavement imperfections have started showing through the seal-coat on these roadways and therefore they have a lower rating.

Williams Street is the other roadway that receives a high traffic volume due to its location near the school and it being a main access roadway to Osceola Avenue and is in need of improvements. The roadway has several utility cuts/patches on the roadway along with settlement in the east side of the pavement. This roadway appears to have been overlaid and seal-coated but the settlement and stress cracks remain visible. Our recommendation for this roadway is that the drain and utility lines be investigated for structural integrity and if needed be replaced or repaired. Once this has been done, the roadway needs to be milled to keep the gutter system intact and then be resurfaced.

5.8.2.6 Roadways in the area south of Osceola Avenue, west of South Beach Parkway, north of Rip Tide subdivision and east of Merrill Boulevard

ROADWAY SEGMENT	SCORE	CODE
Horn Street (Osceola Avenue-South end)	10	A
Pullian Street (Osceola Avenue-South End)	10	A
St Johns Boulevard (Osceola Avenue-South end)	10	A
Desoto Street (60' east of Merrill Boulevard)	10	
A		
Horn Court (Ponce de Leon- South end)	10	A
Pullian Court (Ponce de Leon-South end)	10	A
Sunshine Court (Ponce de Leon-South end)	10	A
Ponce de Leon Street (Merrill Boulevard -Sunshine Ct)	10	A
Merrill Boulevard (Osceola Avenue-South end)	7	C

With the exception of Merrill Boulevard, the roadways in this area are new or in like new condition. The roadways just south of the park are the most recently constructed and have a Miami curb and gutter section. The remainder of the “10’s” has ribbon curb. Merrill Boulevard has a rural section and the roadway is in “good” condition with some minor stress cracks on the pavement. At this time, no improvements to the roadway are recommended.

5.8.2.7 Roadways in the area north and south of Osceola Avenue, east of South Beach Parkway, and west of A1A (3rd Street South):

ROADWAY SEGMENT	SCORE	CODE
Isabella Boulevard (Osceola Avenue-South end)	8	A
Osceola Avenue (South Beach Parkway-Isabella Boulevard)	9	A
Norberta Way (Osceola Avenue-600’ north)	7	C
Burling Way (Osceola Avenue-600’ north)	7	C
Millie Drive (Osceola Avenue-600’ north)	5	C
Sandra Drive (Osceola Avenue-600’ north)	5	D
Isabella Boulevard (260’ north of St Aug. Blvd-North end)	10	A
Isabella Boulevard (St Aug. Blvd-250’ North)	8	A
Isabella Boulevard (St Aug. Blvd-34 th Ave South)	10	A
34 th /Burling Way (Isabella Blvd-South end)	10	A
Isabella Boulevard (34 th Ave South-South end)	8	B

The roadways north of Osceola Avenue lie within an older section of the City and are not within the South Beach Redevelopment District. They have been resurfaced and seal-coated to extend the life of the asphalt. While Norberta Way and Burling Way are in “good” condition, the surface is showing signs of stress cracks throughout the roadways. Millie Drive and Sandra Drive are both in “fair” condition with Sandra Drive being coded at a lower value due to the roadway section. Sandra Drive has been resurfaced more than once and the asphalt was placed in the gutter section which may restrict water flow. To fix this problem, the roadway should be milled and the asphalt removed from the gutter and then resurfaced. There are somewhat new patches over the cross-drains on all four roadways in which indicate that the drain lines were replaced. The remaining roadways in this target area will be discussed individually as follows:

**5.8.2.8 Jacksonville Drive – South Beach Parkway to A1A (3rd Street South)
SCORE 5, CODE C**

The roadway has been seal-coated to extend the wearing life of the asphalt but the stress cracks that were on the original roadway are now showing through the coating. The roadway is heavily traveled by both private and commercial vehicles which has sped up the pavement deterioration. The condition of the roadway will be much worse in the future since there was a new traffic signal installed at A1A (3rd Street South) intersection. Because of the traffic volumes and the current condition of “fair” of the roadway, it received a rating of 5. It is considered to be a prime candidate for milling and resurfacing.

**5.8.2.9 Marsh Landing Parkway – Marsh Landing Blvd to A1A (3rd Street South)
SCORE 5, CODE C**

Marsh Landing Parkway’s asphalt surface is original and appears to have been constructed to withstand the heavy traffic volume and commercial vehicles that constantly use the roadway. The portion between Marsh Landing Blvd and South Beach Parkway is in better condition than the section east of South Beach Parkway but it still shows signs of pavement stress due to the traffic volume. The portion between South Beach Parkway and A1A (3rd Street South) is showing more signs of pavement stress by cracking and slight wheel rutting in the roadway. This is a major route used by commercial and private vehicles. There is a small pothole or cave in on the drain line next to the curb inlet near the Target service entrance which needs to be addressed. Like Jacksonville Drive, these roadway sections should be considered for reconstruction.

**5.8.2.10 South Beach Parkway – North of Millie Drive intersection to J. Turner Butler Boulevard (JTB)
SCORE 4, CODE E/F**

This roadway has been reconstructed/resurfaced under a FDOT D/B project utilizing ARRA funds)

**5.8.2.11 South Beach Parkway – J. Turner Butler Boulevard (JTB) to 150’ south of Ponce de Leon Avenue
SCORE 9, CODE A**

This roadway has been reconstructed/resurfaced under a FDOT D/B project utilizing ARRA funds)

**5.8.2.12 South Beach Parkway – 150’ south of Ponce de Leon Avenue to Ace Hardware service D/W
SCORE 8, CODE B**

This roadway has been reconstructed/resurfaced under a FDOT D/B project utilizing ARRA funds)

**5.8.2.13 South Beach Parkway – Ace Hardware service D/W to south end
SCORE 5, CODE C**

This roadway has been reconstructed/resurfaced under a FDOT D/B project utilizing ARRA funds)

5.9 Dust Control Construction Roadways

Waitz & Moyer personnel met with the City of Jacksonville Beach representatives to discuss any roadway issues that were not apparent during our initial evaluation of the area. During that meeting it was discovered that several of the roadways were originally “Dust Control” projects which when surfaced, did not have the same base and sub-base thickness as normally required in roadway construction. These roadways are listed below with their limits and year constructed.

America Avenue – Jacksonville Drive to south of Republic Drive	90/91
Jacksonville Drive – South Beach Parkway to America Avenue	90/91
Isabella Boulevard – St. Augustine Boulevard to South End	90/91
Riley Street – Theodore Avenue to Seabreeze Avenue	90/91

Theodore Avenue – South Beach Parkway to Riley Street	90/91
Horn Street – Owen Avenue to Seabreeze Avenue	90/91
Pullian Street – Ruth Avenue to Seabreeze Avenue	90/91
Seabreeze Avenue – Riley Street to Pullian Street	90/91
Grande Boulevard – Sanctuary Parkway to North End	94/95
Palm Way – Sanctuary Parkway to North End	94/95
Poinciana Boulevard – Jacksonville Drive to North End	94/95
Tropical Terrace – Jacksonville Drive to North End	94/95

City of Jacksonville Beach took “corings” to determine the thickness of the asphalt surface and the limerock base. The results are listed below with the locations.

#	LOCATION (adjacent to)	ASPHALT THICK	LIMEROCK THICK
C-1	3790 Poinciana Boulevard	2”	7”
C-2	3908 Poinciana Boulevard	1 ¼”	6”
C-3	3810 Tropical Terrace	2 ¼”	6”
C-4	3860 Tropical Terrace	1 ¾”	6”
C-5	3902 Palm Way	1”	2 ½”
C-6	3925 Palm Way	1 ¼”	2 ½”
C-7	4002 Palm Way	1 ⅛”	3”
C-8	4021 Palm Way	1”	3”
C-9	3821 Grande Boulevard	1 ½”	4”
C-10	3848 Grande Boulevard	⅞”	4 ½”
C-11	4004 Grande Boulevard	1”	4”
C-12	4064 Grande Boulevard	1”	3”
C-13	3523 America Avenue	1 ½”	8 ½”
C-14	3987 America Avenue	1 ¼”	6”
C-15	4013 America Avenue	1 ¼”	4”
C-16	4075 America Avenue	1”	3 ½”
C-17	952 Owen Avenue	1 ¼”	6”
C-18	1064 Owen Avenue	1 ½”	6”
C-19	1125 Owen Avenue	1 ⅞”	6”
C-20	955 Theodore Avenue	1 ½”	6”
C-21	1216 Theodore Avenue	1 ½”	7”
C-22	1063 Theodore Avenue	1 ⅞”	7”
C-23	1115 Theodore Avenue	1 ½”	6”
C-24	974 Ruth Avenue	1 ¼”	5”
C-25	1031 Ruth Avenue	1 ¼”	5”
C-26	1150 Ruth Avenue	1 ½”	5”
C-27	1717 Horn Street	1 ¾”	4 ½”
C-28	1817 Horn Street	1 ½”	4 ½”
C-29	1948 Horn Street	1”	4 ½”
C-30	2031 Horn Street	1”	4 ½”
C-31	1744 Pullian Street	1 ⅞”	6”
C-32	1848 Pullian Street	1 ¾”	6”
C-33	1951 Pullian Street	1 ¾”	7”
C-34	2450 Pullian Street	2”	7”

#	LOCATION (adjacent to)	ASPHALT THICK	LIMEROCK THICK
C-35	1804 Riley Street	1 ¼"	3"
C-36	1817 Riley Street	2"	3"
C-37	2210 Riley Street	1 ½"	3"

“Coring” information was not provided for Jacksonville Drive, Isabella Boulevard, and Seabreeze Avenue. The initial evaluation of these roadways did not reveal any major defects, and they were rated in the “good” condition with the exception of Isabella Boulevard which was rated in the “very good” or excellent” condition.

From a structural point of view, the integrity and strength of a roadway depends on the thickness of the asphalt, base, and base layers. Minimal layer thicknesses for local roadways are 1 ¼” of asphalt and 6” of limerock. Collector roadways are 1 ½” of asphalt and 8” of limerock. The existing dust control roadways were built in the 90’s by applying 1 ¼” layer of asphaltic concrete to existing roadways of unknown limerock thickness. Later, most of the roadways were “seal-coated” and some resurfaced.

The dust control roadways that do not meet the minimal thickness of asphalt and limerock layers are:

- America Avenue – Jacksonville Drive to south of Republic Drive
- Riley Street – Theodore Avenue to Seabreeze Avenue
- Horn Street – Osceola Avenue to Seabreeze Avenue
- Grande Boulevard – Sanctuary Parkway to North End
- Palm Way – Sanctuary Parkway to North End

Even though these roadways are shown as in “good” condition in the Roadway Condition Inventory”, WMI recommends rebuilding them in order to meet the minimal layer thicknesses. Also, since Riley and Horn Streets have permitted stormwater systems with wet-detention SWMF’s. WMI recommends rebuilding with curb and gutter to better convey storm runoff and improve the aesthetics of the area. America Avenue, Grande Boulevard and Palm Way could be rebuilt using the treatment credits provided by the projects described in Section 4.0.

5.10 Cost Estimate

Cost estimates have been done for all “D” and “E” rated roadways in the study and for the dust control roadways that do not meet the minimal requirements (see section 5.10). Also, repair cost estimates for roadway depressions and settlements in Rip Tide and Ocean Cay subdivisions have been included. Prices are based on previously bid projects for the City and FDOT.

IMPROVEMENT	PLANNING COST \$	SOURCE
Milling & Resurface: Jacksonville Drive from South Beach Park-	\$493,750	CRA

IMPROVEMENT	PLANNING COST \$	SOURCE
way to A1A (3 rd Street South)		
Milling & Resurface: Marsh Landing Parkway from Marsh Landing Boulevard to A1A (3 rd Street South)	524,401	CRA
Milling & Resurface: Sanctuary Parkway from Sanctuary Boulevard to South Beach Parkway	215,027	CRA
Milling & Resurface: Isabella Boulevard from Jacksonville Drive to South of Osceola Avenue	\$323,038	CRA
Milling & Resurface: 34 th Avenue South (Burling Way) from Isabella Boulevard to Dead End	\$82,266	CRA
Milling & Resurface: Jacksonville Drive from South Beach Parkway to Sanctuary Boulevard	\$230,943	CRA
Milling & Resurface: Roadway Depressions in Rip Tide Subdivision (see sheet R6 in section 5.13.1)	\$78,589	CRA
Milling & Resurface: Williams Street from Seabreeze Avenue to Osceola Avenue	140,672	CRA
Reconstruction: America Avenue from Jacksonville Drive to south of Republic Drive	355,804	CRA
Reconstruction: Riley Street from Theodore Avenue to Seabreeze Avenue	480,116	CRA
Reconstruction: Horn Street from Osceola Avenue to Seabreeze Avenue	543,196	CRA
Reconstruction: Grande Boulevard from Sanctuary Parkway to North End	341,538	CRA
Reconstruction: Palm Way from Sanctuary Parkway to North End	326,418	CRA
TOTAL	\$4,135,758	

Planning cost estimates for roadway reconstruction include stormwater system with curb and gutter. WMI recommends scheduled routine milling and resurfacing program for all “C” rated roadways in the study.

6.0 RECREATIONAL AND TRAFFIC IMPROVEMENTS

6.1 Purpose and Objectives

Study and prepare a conceptual plan for the following:

- A Bike/Pedestrian Trail along the drainage ditch behind Ocean Cay and Paradise Key.
- Safety improvements on South Beach Parkway between Jacksonville Drive and J. Turner Butler Boulevard.

6.2 Introduction

The conceptual plans prepared by Waitz & Moye, Inc. (WMI) are based on information obtained from the City of Jacksonville Beach in the way of drainage maps and “as-built” plans. Other information was obtained from aerials. Site visits were made to verify that the projects were constructed as designed and to identify any visual problems.

6.3 Bike/Pedestrian Trail

6.3.1 Existing Conditions

The area selected for the proposed trail is a privately owned drainage easement that includes a storm water drainage ditch. The easement and ditch run behind Ocean Cay from Osceola Avenue to Paradise Key. The width of this drainage easement and City property varies from 42 feet to 85 feet. The drainage easement can be divided into two sections, the section behind Ocean Cay (North) from Osceola Avenue to approximately 200 feet south of Lift Station #33, and the south section from this point to the Paradise Key Subdivision Recreation area. The City would have to obtain permission from the individual property owners to construct this project due to the language of the plats.

The northerly section of the easement is mostly lined with single family homes which have either a 6-foot wood privacy or chain link fence. The northerly section also has an existing wooden foot bridge that provides residents of Ocean Cay a means to cross over the drainage ditch for beach access.

The drainage ditch in the southerly section is bulk-headed with a slope of 1:1.5. It is lined with single family homes on both sides with 6-foot wood privacy fences. This section of the easement is clear for the most part. The ditch is well maintained, the grass mowed and clear of any debris. The developer of the Paradise Key Subdivision constructed a 4-foot wide trail along each side of the ditch in the easement. These trails are constructed of 2' x 6' wood framing filled with a coarse granite rock and in some areas, topped with crushcrete. Please see Section 6.6.2 of the Appendices of the full report for exact locations of existing features described above.

6.3.2 Recommended Improvements

After studying the existing conditions, safety concerns, and usability, WMI has developed a concept that fully serves the City of Jacksonville Beach and its residents.

6.3.2.1 Northerly Section

The 1,300-foot northerly section consists of a 10-foot wide asphalt trail designed to vehicular usage specifications. The 10-foot width allows for multiple lanes of bike/pedestrian traffic, as well as City maintenance or police/emergency vehicle traffic.

WMI recommends constructing the trail on the easterly side of the drainage ditch. The entrances to the trail will be located at Osceola Avenue and at Jacksonville Drive. The latter will be the limit between the northerly and southerly sections of the trail.

Because of the close proximity to single family homes in this section, it is recommended to construct some sort of privacy barrier, preferably a 6 to 8 feet high concrete screen wall, in key areas of the bike/pedestrian trail. A concrete screen wall provides maximum privacy, blocks noise and is low maintenance. Please see Section 6.6.2 of the Appendices in the full report for specific locations.

Since this trail will be suitable for vehicular traffic, we recommend placing access restriction devices at entry point located at Osceola Avenue and Jacksonville Drive. These can be gates or removable bollards.

6.3.2.2 Southerly Section

The 1,000-foot southerly section runs from northerly section to a recreational park located in the Paradise Key Subdivision. Due to the nature of the easement in this section, it is recommended that a narrower 6-foot wide asphalt bike/pedestrian trail designed to pedestrian usage specifications be constructed. Since the area between the northerly section to the unopened right-of-way of Miami Boulevard is very narrow, the existing ditch needs a bulkhead to make room for the trail.

WMI recommends constructing the trail on the easterly side of the drainage ditch. This side has the most existing room to construct the trail and stays consistent with the northerly section. Since this section is more assessable due to its proximity to public roads, it is not necessary to provide maintenance, police or emergency vehicle access via the trail itself. The smaller width will allow the trail to fit better in the existing area, reduce cost and impact.

The connection between the proposed trail and trail located in the Paradise Key Subdivision needs to be coordinated with the Home Owners Association of this neighborhood.

6.3.2.3 Decorative Safety Fencing

The areas along the existing ditch where the trail will be installed, WMI recommends installing a decorative fence for safety reasons.

6.3.2.4 Lighting

Since the City plans to close the proposed trail at dusk, lighting is not recommended.

6.3.2.4 Trash Receptacles

Trash receptacles are not shown on the conceptual plans, but are included in the estimate.

6.3.2.5 Landscaping & Irrigation

Where possible, trees should be planted to provide shade and visual interest. The northerly section has a very large oak tree that needs to be protected and saved. All disturbed areas should be replaced with bahia sod. Irrigation could be added as needed. This is not shown on the conceptual plans, but is included in the cost estimate.

6.3.2.6 Signage

WMI recommends placing entry signs at key entry points to the trail. These signs could contain the name of the trail, a map of the amenities and trail distance information. Restricted access signs will also be needed at entry points to the trail.

6.4 South Beach Parkway and Jacksonville Drive Improvements

6.4.1. Existing Conditions

South Beach Parkway is a local collector roadway and serves as a major north/south connector between Beach Boulevard and J.T. Butler Boulevard. The segment of South Beach Parkway from Marsh Landing Parkway to Jacksonville Drive is a four-lane, undivided urban section with a sidewalk along both the east and west side. There is an overpass structure at J. Turner Butler Boulevard limiting the width of South Beach Parkway to four lanes.

Marsh Landing Parkway is a two-lane, two-way frontage road on the south side of J. Turner Butler Boulevard. The intersection of South Beach Parkway and Marsh Landing Parkway is located immediately south of the overpass and is signalized. There are single through lanes in all directions and dedicated left-turn lanes on the north, south and west approach.

Sanctuary Parkway is a one-way westbound frontage road on the north side of J. Turner Butler Boulevard. The intersection of South Beach Parkway and Sanctuary Parkway is located 250 feet north of the Marsh Landing Parkway and is signalized. There is a single northbound through lane and a dedicated northbound left-turn lane. There are two southbound lanes on South Beach Parkway. However the inside southbound through lane becomes a dedicated left-turn lane at Marsh Landing Parkway.

The signalized intersection of South Beach Parkway and Jacksonville Drive is located 630 feet north of Sanctuary Parkway and has dedicated eastbound and westbound left-turn lanes. However, there are no dedicated northbound or southbound left-turn lanes.

6.4.2 Traffic Analysis

A traffic operational and safety analysis of South Beach Parkway between Marsh Landing Parkway and Jacksonville Drive was conducted based on existing traffic counts and observations of existing traffic operations during the peak hours. The following is a summary of the analysis.

6.4.2.1 South Beach Parkway at Jacksonville Drive

- a. The lack of northbound and southbound left-turn lanes result in turning vehicles often blocking the through movements. As a result the through movement capacity is reduced and rear end collision potential is high. There is also a high potential for side collisions due to rapid lane changes.
- b. The northbound and southbound left-turn movements are offset reducing driver sight distance increasing the potential for crashes.
- c. The existing traffic signal does not provide protected northbound and southbound left-turn movement.

6.4.2.2 South Beach Parkway at Sanctuary Parkway

- a. The southbound right-turn queue becomes excessive during peak periods. As a result the southbound through movement capacity is reduced and rear end collision potential is high.
- b. The northbound left-turn queue becomes excessive during peak periods. As a result the northbound through movement capacity is reduced and rear end collision potential is high.
- c. Sanctuary Parkway is 24-feet wide, but is marked as a single one-way westbound lane. As a result, the northbound permissive left-turn movement and southbound right-turn movement conflict and are not concurrent. Capacity and safety could be increased if the full width of pavement on Sanctuary Parkway is utilized providing each movement with a dedicated receiving lane.

6.4.2.3 South Beach Parkway at Marsh Landing Parkway

- a. The northbound and southbound left-turn movements are offset reducing driver sight distance increasing the potential for crashes.
- b. There are intersection guide lines that were installed due to the left-turn offset problem. These lines could be confusing to drivers.

6.4.3 Recommendations

6.4.3.1 South Beach Parkway and Jacksonville Drive

It is recommended that dedicated northbound and southbound left turn lanes be constructed at the intersection. The turn lane queue length should be a minimum of 200 feet. The existing signal should be modified to provide permissive/projective left turn northbound and southbound movements.

6.4.3.2 South Beach Parkway and Sanctuary Parkway

- a. It is recommended that a dedicated southbound right turn lane be installed.
- b. After milling and resurfacing, at least 400 feet of Sanctuary Parkway needs to be restriped to provide two (2), 12-foot wide westbound lanes and the merging from two lanes to one lane.

6.4.3.3 South Beach Parkway and Marsh Landing Drive

The northbound and southbound left turn lanes at the intersection need to be aligned by restriping the intersection.

6.4.4 Conceptual Design

Various alternatives for accomplishing the recommended improvements were investigated. Existing conditions such as underground and overhead utilities, drainage, signalization and adjacent development were considered.

There are four electrical concrete poles along the west side of South Beach Parkway which would need to be relocated. According to the Beaches Electrical Services (BES) the estimate cost to relocate these poles will be approximately \$ 100,000.00.

The most feasible alternative is to add a 12-foot wide lane on west side of South Beach Parkway between Sanctuary Parkway and Jacksonville Drive as shown in Concept A. The analysis also considered the future development of the parcel located west of South Beach Parkway. The location of the future driveway of the development was discussed with the City of Jacksonville Beach Planning Department, and it was determined that the driveway would align with the existing South Beach Regional Shopping Center driveway located 150 feet north of Sanctuary Parkway.

Concept B was developed considering the future driveway and the need for future signalization. A traffic analysis of the proposed conditions was conducted, and it was determined that the safest and most efficient operation would be to relocate the existing traffic signal on South Beach Parkway at Sanctuary Parkway to the proposed commercial driveway depicted in Concept B.

Concept A would provide the recommended traffic operational and safety improvements, however, Concept B is recommended should development proceed on the existing vacant parcel west of South Beach Parkway. Both concepts would require the City to purchase additional property.

6.5 Cost Estimate

Cost estimates have been done for each recommended improvement. Prices are based on past bid projects for the City and FDOT products. Detailed cost estimates for each improvement are in the appendices.

IMPROVEMENT	PLANNING COST \$	SOURCE
Bike/Pedestrian Trail	\$714,794	CRA
Roadway Improvement Concept A	\$741,822	CRA
Roadway Improvement Concept B	\$907,627	CRA

7.0 REUSE MASTER PLAN PROJECTS

A Reuse Master Plan was prepared by Jones Edmunds & Associates, Inc. in February 2010 for the City of Jacksonville Beach. A portion of the proposed reuse system is located in the South Beach Community Redevelopment District. Additional reuse system improvements will have to be constructed to connect to these improvements. The proposed route of the reuse system includes:

- Seabreeze Avenue (Seabreeze Elementary School to 9th Street South)
- 9th Street South/South Beach Parkway (Seabreeze Avenue to JTB)
- South Beach Parkway (JTB to St. Johns County Line)
- Jacksonville Drive (South Beach Parkway to A1A)
- Osceola Avenue (South Beach Parkway to Sandra Drive)

The following is a list of the reuse projects and their related planning costs.

DESCRIPTION	PLANNING COST \$	FUNDING
Seabreeze Avenue	\$171,810	CRA
9 th Street South/South Beach Parkway	\$1,805,040	CRA
Osceola Avenue	\$167,808	CRA
Jacksonville Drive	\$365,148	CRA
South Beach Parkway (J. Turner Butler Boulevard to St. Johns County line)	\$374,808	CRA
SUBTOTAL COST	\$2,884,614	CRA

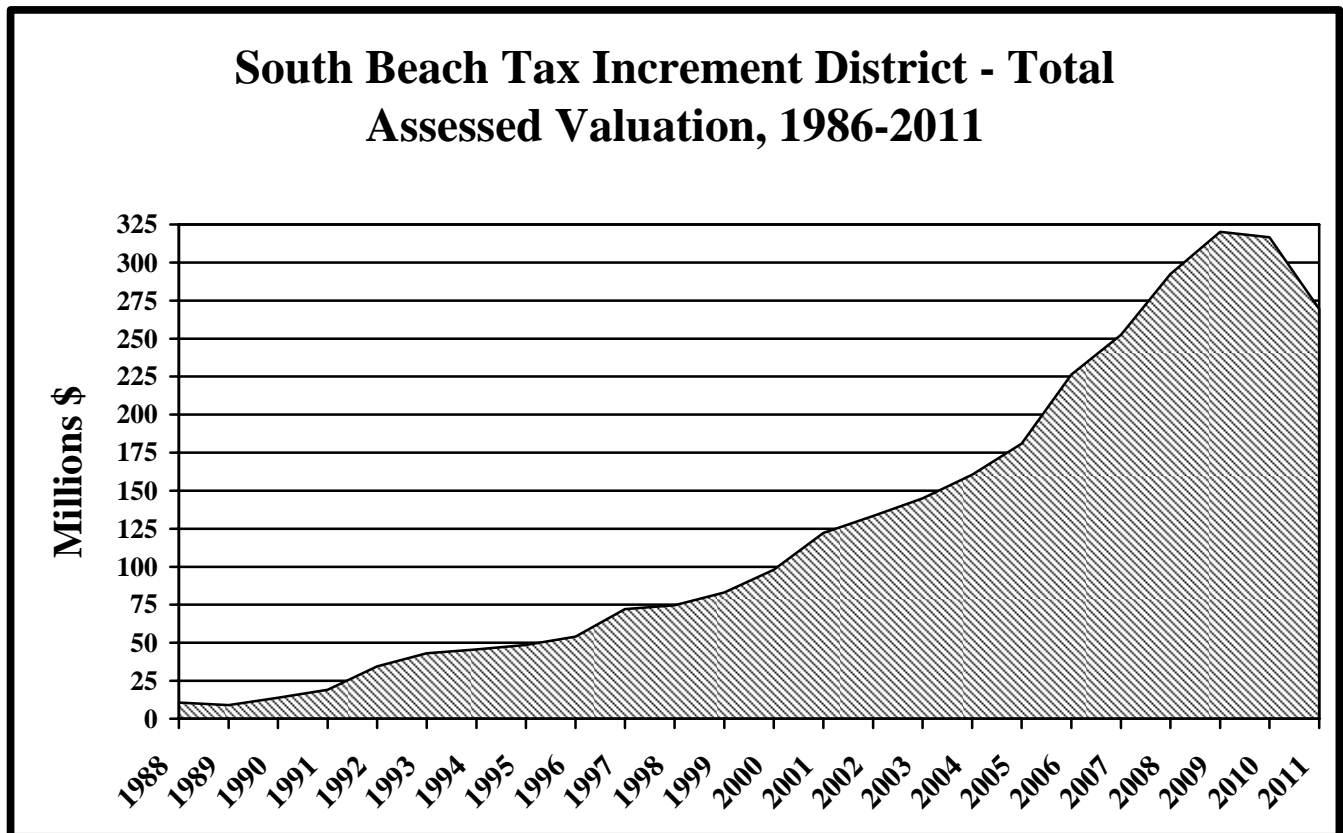
8.0 TAX INCREMENT TRUST FUND REVENUE ESTIMATES AND 3-TIERED IMPLEMENTATION PROGRAM

8.1 South Beach Tax Increment Trust Fund

On August 3, 1987, the City of Jacksonville Beach adopted Ordinance No. 7354 establishing the South Beach Tax Increment Trust Fund. As provided by law, the ordinance designated the 1986 certified Duval County tax roll for the parcels within the redevelopment district as the “Base Year.”

The total assessed value of the property for 1986 (as adjusted after the redevelopment area was expanded in 1988) equaled \$6,518,754. The initial appropriations from the three taxing authorities were made, as provided by law, in January 1988. The total amount appropriated was \$77,692. After the Beaches Hospital Authority sold their facility to Baptist Hospital, they were dropped as a taxing authority, leaving the Cities of Jacksonville Beach and Jacksonville (Duval County) as the contributors to the trust fund.

As illustrated in the graph below, the assessed valuation in South Beach has risen to \$269,402,208 since 1987. Appropriations from the taxing authorities over the 23-year existence of the Trust Fund have totaled \$29,144,698. The money deposited in the South Beach Tax Increment Trust Fund has been entirely for the public-private partnerships and infrastructure improvement projects described in the Introduction to this document, or to cover operating costs and debt service related to the implementation of those projects.



The tax increment trust fund for the South Beach Community Redevelopment District has six years remaining before the end of its 30-year, statutory life span. Conservatively, it is projected that the District will generate about \$13.8 million in additional tax increment trust fund revenue from January 2012 through January 2017. The following table illustrates the estimated salaries, operating expenses, committed capital expenditures, and calculates the amount of funds that are available to implement the prioritized projects set out in this document.

TAX INCREMENT CASH FLOW, FY 2011-FY 2017							
	JANUARY 2011	JANUARY 2012	JANUARY 2013	JANUARY 2014	JANUARY 2015	JANUARY 2016	JANUARY 2017
BEGINNING CASH BALANCE	\$1,515,314	\$1,178,124	\$49,904	\$42,893	\$35,657	\$28,552	\$17,669
REVENUE:							
• Tax increment ¹	\$2,706,999	\$2,734,069	\$2,761,410	\$2,789,024	\$2,816,914	\$2,845,083	\$2,873,534
• Interest earnings	<u>\$20,000</u>	<u>\$20,000</u>	<u>\$20,000</u>	<u>\$20,000</u>	<u>\$20,000</u>	<u>\$20,000</u>	<u>\$20,000</u>
TOTAL	\$2,726,999	\$2,754,740	\$2,782,759	\$2,811,058	\$2,839,640	\$2,868,507	\$2,897,664
EXPENDITURES:							
• Personnel services	\$53,078	\$53,874	\$54,682	\$55,503	\$56,335	\$57,180	\$58,038
• Operating expenses	\$48,912	\$12,972	\$13,102	\$12,233	\$13,365	\$13,499	\$13,634
• Capital outlay							
▪ Committed ²	\$1,794,915	\$0	\$0	\$0	\$0	\$0	\$0
▪ Proposed ³	\$0	\$2,950,718	\$1,855,063	\$1,880,995	\$2,104,010	\$2,133,927	\$2,839,532
• Debt service	<u>\$1,167,284</u>	<u>\$864,725</u>	<u>\$865,573</u>	<u>\$866,530</u>	<u>\$670,309</u>	<u>\$671,360</u>	<u>\$0</u>
TOTAL	\$3,064,189	\$3,882,960	\$2,789,769	\$2,818,295	\$2,846,745	\$2,879,390	\$2,915,333
ENDING CASH BALANCE:	\$1,178,124	\$49,904	\$42,893	\$35,657	\$28,552	\$17,669	\$0
RESERVES:							
• Debt service	\$41,719	\$33,192	\$25,947	\$18,473	\$11,127	\$0	\$0
• Operating expenses	\$25,498	\$16,712	\$16,946	\$17,184	\$17,425	\$17,670	\$0
UNRESERVED BALANCE:	\$1,110,908	\$0	\$0	\$0	\$0	\$0	\$0

8.2 3-Tiered Implementation Program

A tiered implementation program has been developed to include all of the proposed improvements detailed in this report. These improvements cover upgrades and replacement of water, sewer, stormwater facilities, and roadways within the South Beach Community Redevelopment District. The Community Redevelopment Agency (CRA) has sufficient tax increment trust fund revenues to allocate the necessary funding to complete the recommended projects in this capital improvement plan for the District. Projects have been arranged in three tiers according need and importance.

SOUTH BEACH DISTRICT INFRASTRUCTURE IMPROVEMENTS

DESCRIPTION/LOCATION	FUNDING SOURCE	PLANNING COST
1ST TIER PROJECTS:		
WATER SYSTEM IMPROVEMENTS		
Replacement of existing 6" water main pipe located on Williams Street - Osceola Avenue to Seabreeze Avenue	CRA	\$129,139
Replacement of existing 2" water main pipe located on Riley Street - Ruth Avenue to Owen Avenue	CRA	\$72,899
Replacement of existing 6" water main pipe located on Owen Avenue – Williams Street to Horn Street	CRA	\$85,800
SUBTOTAL		\$287,838
SEWER SYSTEM IMPROVEMENTS		
Replacement of existing 8" sewer pipe located on Williams Street - Osceola Avenue to Seabreeze Avenue	CRA	\$175,499
Replacement of existing 8" sewer pipe located on Ruth Avenue - Pullian Street to Riley Street	CRA	\$148,305
Replacement of existing 8" sewer pipe located on Seabreeze Avenue - 10th Street to Williams Street	CRA	\$156,417
Replacement of existing 8" sewer pipe located on Riley Street - Theodore Avenue to Seabreeze Avenue	CRA	\$163,254
Replacement of existing 8" sewer pipe located on Horn Street - Owen Avenue to Seabreeze Avenue	CRA	\$120,592
SUBTOTAL		\$764,067
STORMWATER PIPING IMPROVEMENTS		
William Coastal Boulevard Heights Area: Riley St. - Theodore Avenue to Osceola Avenue - Pipe existing swale and connect to exist. piping	CRA	\$74,117
Ocean Terrace Area: North of Jacksonville Drive - Palm Way to Grande Boulevard - Pipe existing swale and connect to exist. piping	CRA	\$180,355
South Beach Regional Shopping Center: Access manhole installation and de-siltation construction	CRA	\$237,994
South Beach Parkway: Stormwater system interconnection on South Beach Parkway at Rip Tide pond discharge	CRA	\$87,753
SUBTOTAL		\$580,219

SOUTH BEACH DISTRICT INFRASTRUCTURE IMPROVEMENTS

DESCRIPTION/LOCATION	FUNDING SOURCE	PLANNING COST
STORMWATER MANAGEMENT IMPROVEMENTS		
Central and South Basin St. Johns River WMD Permit	CRA/CITY	\$41,700
SUBTOTAL		\$41,700
ROADWAY IMPROVEMENTS		
Milling & Resurface: Jacksonville Drive from South Beach Parkway to A1A (3 rd Street South)	CRA	\$493,750
Milling & Resurface: Sanctuary Parkway from South Beach Parkway to Sanctuary Boulevard	CRA	\$215,027
Milling & Resurface: Marsh Landing Parkway from Marsh Landing Boulevard to A1A (3 rd Street South)	CRA	\$524,401
Roadway Reconstruction: America Avenue from Jacksonville Drive to south of Republic Drive	CRA	\$355,804
SUBTOTAL		\$1,588,982
TOTAL ROADWAY AND UTILITY COSTS – 1ST TIER		\$3,262,806
2ND TIER PROJECTS:		
STORMWATER PIPING IMPROVEMENTS		
Jacksonville Beach Heights Area: Desoto Avenue - Merrill Road to St. Johns Boulevard - Pipe existing swale and connect to existing. piping	CRA	\$45,375
Osceola Avenue: Stormwater system improvements – Riley Street to Horn Street and South Beach Parkway to Sandra Drive Replace existing. pipe with larger pipe	CRA	\$636,752
SUBTOTAL		\$682,127
STORMWATER MANAGEMENT IMPROVEMENTS		
Osceola Regional Pond Modifications	CRA	\$511,966
South Basin De-siltation Canal Modifications	CRA	\$420,900
SUBTOTAL		\$932,866
ROADWAY IMPROVEMENTS		

SOUTH BEACH DISTRICT INFRASTRUCTURE IMPROVEMENTS

DESCRIPTION/LOCATION	FUNDING SOURCE	PLANNING COST
Milling & Resurface: Williams Street from Seabreeze Avenue to Osceola Avenue	CRA	\$140,672
Milling & Resurface: Isabella Boulevard - Jacksonville Drive to south of Osceola Avenue	CRA	\$323,038
Milling & Resurface: 34th Avenue South (Burling Way) - Isabella Boulevard to deadend	CRA	\$82,266
Milling & Resurface: Jacksonville Drive - South Beach Parkway to Sanctuary Boulevard	CRA	\$230,943
Milling & Resurface: Roadway Depressions in Rip Tide Subdivision	CRA	\$78,589
Roadway Reconstruction: Riley Street from Theodore Avenue to Seabreeze Avenue	CRA	\$480,116
Roadway Reconstruction: Horn Street from Osceola Avenue to Seabreeze Avenue	CRA	\$543,196
Roadway Reconstruction: Grande Boulevard from Sanctuary Parkway to North End	CRA	\$341,538
Reconstruction: Palm Way from Sanctuary Parkway to North End	CRA	\$326,418
SUBTOTAL		\$2,546,776
TOTAL ROADWAY AND UTILITY COSTS – 2ND TIER		\$4,161,769
3RD TIER PROJECTS:		
WATER SYSTEM IMPROVEMENTS		
Water Treatment Plant #2 Improvements	CRA/CITY	\$310,257
SUBTOTAL		\$310,257
SEWER SYSTEM IMPROVEMENTS		
Phase out Lift Station #30 via 8" gravity sewer extension - BES Substation and South Beach Parkway	CRA	\$50,455
SUBTOTAL		\$50,455
WATER REUSE IMPROVEMENTS		
Seabreeze Avenue Reuse System Improvements	CRA	\$171,810
9th Street South/South Beach Parkway Reuse System Improvements	CRA	\$1,805,040

SOUTH BEACH DISTRICT INFRASTRUCTURE IMPROVEMENTS

DESCRIPTION/LOCATION	FUNDING SOURCE	PLANNING COST
Osceola Avenue Reuse System Improvements	CRA	\$167,808
Jacksonville Drive Reuse System Improvements	CRA	\$365,148
South Beach Parkway Reuse System Improvements (J. Turner Butler Boulevard to St. Johns County line)	CRA	\$374,808
SUBTOTAL		\$2,884,614
RECREATIONAL TRAIL IMPROVEMENTS		
Bike/Pedestrian Trail Along Drainage Canal Between Jacksonville Drive and Osceola Avenue	CRA	\$714,794
SUBTOTAL		\$714,794
TOTAL PROJECT COSTS – 3RD TIER		\$3,960,120
TRAFFIC SAFETY IMPROVEMENTS		
Roadway Improvement Concept A - South Beach Parkway, Jacksonville Drive and Sanctuary Boulevard	CRA	\$741,822 (excluding any necessary land costs)
Roadway Improvement Concept B - South Beach Parkway, Jacksonville Drive, and Sanctuary Boulevard	CRA	\$907,627 (excluding any necessary land costs)
GRAND TOTAL LESS TRAFFIC SAFETY PROJECT		\$11,384,695
GRAND TOTAL INCLUDING TRAFFIC SAFETY CONCEPT A		\$12,126,517
GRAND TOTAL INCLUDING TRAFFIC SAFETY CONCEPT B		\$12,292,322

9.0 NEXT STEPS

Following the review and approval of this amendment by the Jacksonville Beach Community Redevelopment Agency, it will be transmitted to the City Council in the form of a Resolution Amending the South Beach Community Redevelopment Plan. This summary report will be attached as an exhibit to the Resolution.

After sufficient public notice and required notices to the taxing authorities who appropriate funds to the South Beach Tax Increment Trust Fund, the City Council can consider adoption of the Resolution. If approved, this capital improvement plan replaces any other adopted financial plans for the South Beach District.

SOUTH BEACH REDEVELOPMENT AREA

