



# **Floodplain Management Plan**

**2015-2020**

Table of Contents

Introduction.....3

Organization and Public Involvement.....3

Coordination with other Agencies.....3

Assess the Hazard.....4

Assess the Problem.....7

Floodplain Program Goals.....14

Review of Current Activities.....14

Review of Possible Activities.....26

Action Plan.....29

Implementation and Evaluation.....32

Floodplain Map.....Following Page 32

# **CITY OF SARASOTA FLOODPLAIN MANAGEMENT PLAN**

## **INTRODUCTION**

The City of Sarasota is located in northwestern Sarasota County, in southwest Florida. The City occupies an area of nearly 24 square miles, of which approximately 10 square miles is water. In 1902, the Town of Sarasota came into being. Large land purchases and subsequent investments were followed by rapid development. In 1914, Sarasota was incorporated as a city. The population of the City increased from 8,498 in 1930 to 40,237 in 1970. Although the City experienced a significant loss of population during the recent recession, the population has begun to increase again and was 52,584 in 2014 according to the Bureau of Economic and Business Research at the University of Florida. The City of Sarasota, as do most coastal communities in Florida, experiences a significant increase in population during the winter months.

## **ORGANIZATION AND PUBLIC INVOLVEMENT**

The City of Sarasota's Floodplain Management Committee is composed of the members of the Public Information Office, Building and Zoning, Engineering, Planning, Sustainability, and Emergency Management Departments within the City. This Committee began its initial review of the Floodplain Management Plan in June of 2015 and conducted a series of meetings in compliance with the National Flood Insurance Program Community Rating System Coordinator's Manual in order to update our currently approved plan.

A public meeting to obtain citizen input on the draft was held on July 16, 2015 at the City of Sarasota Park, Recreation, and Environmental Protection Advisory Board.

Further public involvement is also provided by the City of Sarasota's participation in the Sarasota County Unified Local Mitigation Strategy (LMS) Work Group which includes representatives from the Cities of Sarasota, North Port, and Venice, The Town of Longboat Key, Sarasota County, and Sarasota Memorial Hospital. Each jurisdiction's Floodplain Management Plan is included as an annex to the overall Multi-jurisdictional Local Mitigation Strategy Plan. The LMS Work Group, which includes the City's CRS Coordinator and Emergency Manager, has met on a quarterly basis since December of 2007. Agendas, minutes, and advertisement may be found in Appendix F of the June 2015, Sarasota County Unified Local Mitigation Strategy.

## **COORDINATION WITH OTHER AGENCIES**

Personnel from the City of Sarasota coordinate on a monthly basis at a minimum with other agencies as it relates to floodplain management activities. Within these meetings, discussion and action on current projects, plans, technical data, reviews of existing studies and reports take place. Listed below are some of the coordination activities that take place:

- The City of Sarasota and Sarasota County entered into an Inter-local Agreement for the Consolidation of Storm-water Management in 1998. Discussions monthly.
- The Sarasota County Unified Local Mitigation Strategy (LMS) Work Group. Members include but not limited to; City of North Port, City of Sarasota, City of Venice, Sarasota County, Sarasota Memorial Hospital, and the Town of Longboat Key. Meets quarterly.
- Florida Division of Emergency Management Region 6. Members include but not limited to; Manatee County, Sarasota County, City of North Port, City of Sarasota, DeSoto County, Charlotte County, Highlands County, Okeechobee County, Glades County, Hendry County, Lee County, City of Cape Coral, and Collier County.
- Manatee County Disaster Preparedness and Planning Committee. Members include but not limited to; Manatee County Emergency Management, Florida Department of Health Manatee County, Manatee County Building and Development Services, Manatee County Community Services, Manatee County Public Works, Manatee County Utilities, Manatee County Parks & Natural Resources, City of Ana Maria, City of Bradenton, City of Bradenton Beach, City of Holmes Beach, City of Palmetto, City of Sarasota, Town of Longboat Key, American Red Cross, Florida National Guard, United States Coast Guard, Manatee Memorial Hospital, Blake Hospital, Lakewood Ranch Hospital, Cedar Hammock Fire Rescue, East Manatee Fire Rescue, North River Fire District, Parrish Fire District, Southern Manatee Fire District, West Manatee Fire District, and the Manatee County Sheriff's Office.
- Southwest Florida Regional Planning Council, Local Emergency Planning Committee. Members include but not limited to; Florida National Guard, Florida Department of Health, Collier County Government, Sarasota County Fire Department, Lee County Utilities, Glades County Emergency Management, Mote Marine, Florida Power & Light, Lee Memorial Health System, Charlotte County Sheriff's Office, and Cape Coral Fire Rescue.

## **ASSESS THE HAZARD**

Flooding results from two major sources in the City of Sarasota. Coastal areas are subject to inundation from surges from the Gulf of Mexico and associated coastal waves. Inland areas become flooded when rainfall accumulates in low, flat areas which have inadequate or poorly maintained drainage systems. Land development activities have significantly increased runoff volumes and have exceeded the capacity of natural or manmade drainage systems. Rainfall occurs primarily due to thunderstorm activity in the summer months, with additional rainfall occurring with the passage of hurricanes.

### **Hurricanes**

Hurricanes cause the most severe flooding problems in the City and it should be noted that most hurricanes occur in the latter portion of the rainy season. Thus, rain associated

with hurricanes commonly falls when conditions are most critical for runoff. A representative sample of some damaging storm activity demonstrates the level of coastal flood hazard experienced in the City of Sarasota:

***October 24, 1921:*** Flooding conditions were prolonged due to the slow forward movement of the storm. A combination of high tides (above 7 feet) with wave action resulted in heavy damage along the coastline in Sarasota County. Total loss in the City of Sarasota was estimated at \$200,000.

***September 19, 1926:*** Flooding in the Sarasota area caused damage estimated at \$1 million. In addition, wave action resulted in considerable erosion along the coast in Sarasota County.

***September 10, 1960:*** Hurricane Donna resulted in tidal heights of approximately 3 feet above normal in Sarasota. Pre-storm rainfall of nearly 10 inches saturated the ground. That, combined with rainfall of 5 to 7 inches during the storm caused extensive flood damage.

***October 19, 1968:*** Tides of up to 5 feet above normal resulted in considerable flood damage.

***June 18, 1972:*** Although the eye of Hurricane Agnes passed approximately 150 miles west of the south Florida peninsula, it produced high tides of 3 feet above normal and five inches of rainfall. High tides caused damage to many homes, seawalls, revetments and roads along the coastline.

***June 18, 1982:*** A subtropical storm, commonly known as the “No Name Storm”, hit the Sarasota area with 60 mph winds and 6 inches of rain with little or no warning from weather forecasters. The storm and abnormally high tides caused considerable structural flood damage to properties.

***September 2, 1985:*** Hurricane Elena caused beach erosion and flooding along the barrier islands. Building on the effects of Elena, tropical storm Juan caused serious structural damage to shoreline areas of Sarasota County. Elena required the evacuation of 37,000 persons, of which about 6,500 stayed in shelters.

***October 16, 1987:*** Hurricane Floyd brought heavy rains and strong winds, resulting in flooding.

***June 23, 1992:*** This storm exceeded the 100-year storm both in terms of duration and intensity, dropping more than 20 inches of rain in northern Sarasota County. An estimated 3,000 structures were flooded during this intense storm.

***July 18, 1995:*** This greater than 100-year storm dropped more than 11 inches of rain within a 15 hour period, resulting in structural flooding.

***November, 1997:*** In less than 14 hours, more than 10 inches of rain fell in the Phillippi Creek Basin, located in the southern portion of the City, flooding about 190 structures.

This rain fell on already saturated soil, causing runoff to flow shortly after the storm began, with water levels rising quickly in the County's Main A Canal.

A hurricane vulnerability zone is based on storm intensity. Generally, storm intensities are more severe immediately adjacent to large bodies of water such as the Gulf of Mexico and Sarasota Bay. The hurricane vulnerability zone is defined as those areas requiring evacuation in the event of a Category 3 storm event. Storm events are classified by storm categories numbered 1 through 5, with Category 1 storms having the least potential for destruction and Category 5 storms having the greatest potential for destruction.

***September 14, 2001:*** Gabrielle, a tropical storm which approached Category 1 hurricane status, made landfall near Venice, Florida to the south of Sarasota. Several inches of rain fell on the area, which resulted in some structural flooding.

***August 13, 2004:*** Hurricane Charley, which developed into a Category 4 storm, was forecast to remain just offshore of the west coast of Florida and make landfall near the mouth of Tampa Bay. However, the storm took an easterly turn and made landfall in the Punta Gorda area, about 50 miles south of Sarasota. It then proceeded northeast through Arcadia, Lake Wales, and Orlando before exiting the state between Daytona and Jacksonville. Because of the relatively compact size of the storm and the fact that it was fast moving, there was little impact on the City of Sarasota in the form of wind or rainfall.

***September 5, 2004:*** Hurricane Frances was a very slow moving Category 2 storm, with a diameter approximately the size of the state of Texas, which impacted virtually the entire state of Florida. The eye of the storm made landfall near Stuart, and then moved across the state in a northwest direction and went back into the Gulf of Mexico near New Port Richey. The eye stayed to the northeast of Sarasota, but several inches of rainfall fell in Sarasota during the course of the storm, which resulted in some flooding of structures.

***September 16, 2004:*** Hurricane Ivan, a strong Category 4 storm, made landfall near Gulf Shores, Alabama. The storm remained west of Sarasota, out in the Gulf of Mexico far enough so that the only impact was beach erosion and damage to some docks as a result of changing tides.

***September 26, 2004:*** Hurricane Jeanne made landfall on the east coast of Florida near Stuart. The storm then moved northwest, but the eye remained to the northeast of Sarasota. During the course of the storm, up to 8 inches of rainfall resulted in the flooding of some structures. The storm remained on a northerly track and moved into Georgia.

***October 24, 2005:*** Hurricane Wilma made landfall in Florida near Cape Romano and moved across the peninsula in less than 5 hours. The location of the landfall was far enough south of the City of Sarasota that winds and rain were minimal.

***June 2, 2007:*** Tropical Storm Barry made landfall near Tampa, dropping a few inches of rain and creating high surf conditions along the west coast of Florida, including Sarasota.

**August 19, 2008:** Tropical Storm Fay made landfall in Florida south of Naples near Cape Romano and moved to the northeast, with rainfall amounts in excess of 20 inches reported on Florida's east coast near Melbourne. Because of the path of the storm, there was a minimal impact in Sarasota.

**June 23-26, 2012:** Tropical Storm Debby developed from a trough of low pressure in the central Gulf of Mexico and made landfall near Steinhatchee, Florida. Initial predictions anticipated the storm to move towards Louisiana or Texas, but the storm moved in the opposite direction. Upwards to 10 inches of rain fell within the City of Sarasota flooding many secondary roads and the Lido Beach parking lot was impacted by flooding from the shifting of the high water mark due to surf and tide conditions. Overall, Sarasota County suffered almost \$2 million in beach erosion damage which included Lido Key.

### **Floodplains**

The City's floodplains are identified on the map that is at the end of this document, and are defined by the "A" and "V" zones of the flood insurance rate maps of the Federal Emergency Management Agency (FEMA). "A" zones are areas subject to the 100-year flood hazard and "V" zones are subject to the 100-year flood hazard and associated wave action. The areas within the floodplains are largely developed and include residential, commercial, and recreational and community uses.

### **ASSESS THE PROBLEM**

Many things can contribute to flooding, including hurricanes, tropical storms, sea level rise, and large rainfall events. A historical look at such storm events was discussed earlier in this document. There are more than 4,000 structures located in the floodplains within the City of Sarasota. It is estimated that more than 90 percent are residential (some are condominiums or apartments with multiple dwelling units in a single structure), with the remaining 5 to 10 percent being commercial or industrial. Some structures are subject to repeat flooding. The most current Repetitive Loss List data issued to the City of Sarasota by the Federal Emergency Management Agency is dated fall, 2014, which lists repetitive loss properties in the City based on losses from January 1, 1978. There are 53 properties located within the incorporated boundaries of the City of Sarasota. Repetitive loss properties are discussed in the Sarasota County Unified Local Mitigation Strategy (LMS), and a map of all repetitive loss properties in Sarasota County, including the City of Sarasota, can be found in Appendix G of the LMS. Nearly all of the repetitive loss properties are residential structures.

### **Life Safety: Warnings and Evacuations**

Hurricane vulnerability and the resulting flooding is a fact of life for local governments in coastal locations. Therefore, hurricane evacuation planning is both a necessity and major concern. Much of the City lies within the storm surge category areas used to define evacuation during storm events. The ability to safely evacuate during a natural disaster depends on strong disaster preparedness planning and requires the cooperation of all affected citizens.

In 2014, the City of Sarasota created its own Emergency Management Division within the Police Department who is responsible for developing and administering all-hazards preparedness planning through the City's Comprehensive Emergency Management Plan (CEMP). The City's Emergency Manager works closely with the Sarasota County Department of Emergency Management who is responsible for developing and administering hurricane preparedness planning for the entire Sarasota County area through the County's Comprehensive Emergency Management Plan (CEMP). These plans establish uniform policy that jurisdictions use to create specific procedures and guidelines during floods and other similar emergencies. The City of Sarasota coordinates its hurricane, flooding, and other emergency efforts with the Sarasota County Department of Emergency Management through our Emergency Operations Center to their Emergency Operations Center.

Prior to the arrival of a storm, the Public Safety Group determines which areas are to be evacuated. The Sarasota County Sheriff's Office is responsible for coordinating the evacuation of Sarasota County, with assistance from the City of Sarasota and its various departments, to execute the notification of citizens in the areas to be evacuated and the establishment and monitoring of evacuation routes. Sarasota County Emergency Management also supports the Sarasota County Sheriff and affected municipalities with resource requests and to make sure the public is informed.

The City of Sarasota maintains three Tactical First-In Teams whose primary mission is to clear routes to critical infrastructure within the City. These teams are assembled in advance of a storm (before wind speed reaches 45 mph), and is activated by City's Emergency Manager from the Emergency Operations Center. These teams are self-supporting and have the communications assets available to redeploy based on the current threat situation. Teams are composed of members from the City of Sarasota Police Department, City of Sarasota Public Works Department, Verizon, Florida Power and Light (FPL), Sarasota County School Board Transportation, and Sarasota County Fire and Rescue. These teams conduct an annual drill.

Sarasota County partners with all municipalities to develop and maintain a "Local Mitigation Strategy" (LMS). The program's purpose is to encourage local jurisdictions to minimize risks and costs associated with natural disasters by planning and pursuing preventive measures such as strengthening existing vulnerable structures, elevating vulnerable structures, modifying building codes is appropriate, implementing public awareness programs, and preparing emergency response plans. The program is coordinated through the Sarasota County Emergency Management Department. Sarasota County has a FEMA approved LMS as of February 23, 2011 and adopted by Resolution by Sarasota County and all municipalities, including the City of Sarasota.

The City of Sarasota and Sarasota County continue to partner and collaborate in order to add and maintain in technological systems that have increased the effectiveness in alerting the public throughout both of our jurisdictions to potential emergency situations and predicting where storm-related flooding is anticipated.

***Emergency Alert System.*** Sarasota County houses a transmitter in the Emergency Operations Center to provide emergency backup power for the EAS broadcast station. It



provides a direct method to record message and be distributed immediately to the EAS broadcast station.

***Telephone/Electronic Message Contact.*** The City of Sarasota and Sarasota County both maintain a telephone electronic mail notification system. Both systems enable their respective citizens to register in the data base as well as gather data from the telecommunications industry. Both systems have the capability of being preprogrammed with the telephone numbers of households located in flood-prone, special flood hazard areas, or hurricane evacuation areas and can call hundreds of residents in a short period of time. It is used to announce voluntary and/or mandatory evacuations due to storm threats or other potential emergency situations. The system was used successfully to alert flood prone and repetitive loss property owners of an impending flood threat during the 1997 El Nino rain events. In September of 1998 the system was used to announce the mandatory evacuation of 10,000 barrier island residents during the Hurricane Warning for Hurricane Georges. In 2004, the system was used to notify barrier island residents of the evacuation notice when Hurricane Charley threatened the area. Historical flood data and hurricane evacuation areas were used to establish the telephone number database used in this automated warning system to alert those at high risk during storm events.

***ARMS System.*** In August of 1998, Sarasota County's Emergency Management Department completed installation of a virtual rain gauge. Linked to a satellite system, the virtual rain gauge provides a precise picture of how much rain will fall in a specific area. This system has been connected with four existing flood monitors on the Myakka River and the Sarasota County Drainage Operation's network of 30± gauges that includes river flood gauges and salt-water tide gauges to give the Emergency Management Department the early warning capability to reduce losses caused by storm-related riverine flooding. The data is accessible via the Internet at <http://sarasota.wateratlas.usf.edu/datamapper/>.

***Meteorological Services/Satellite Communications.*** The Emergency Operation Center (EOC) at Sarasota County has a National Weather Service emergency alert system for monitoring weather developments and receives updates from the National Hurricane Center in Miami and the National Weather Service office in Ruskin. The EOC and the 911 Center are connected to the State Warning Point (SWP) in Tallahassee. The SWP is staffed 24 hours a day, 365 days a year and serves as Florida's primary point of contact for a wide variety of natural and manmade emergencies. The SWP provides notification to the affected counties, Emergency Support Functions, and other affected members of the State Emergency Response Team (SERT). Additionally, weather emergency notification radios have been distributed to key facilities around the City that have a high volume of pedestrian traffic and within 24 hour staffing position in order to alert employees in the field of impending weather emergencies.

***Global Positioning System (GPS).*** A community Base Station receiver for the GPS is used by many Sarasota County agencies. This system develops data collection, conducts real time surveying, and vehicle location or Emergency Operations and Transit Operations.

***800 MHz Trunk Radio System.*** This county-wide interoperable radio communications system has expanded to over 4,000 units since its implementation in 1996. There are just

over 1,000 mobile and 3,000 portable units in service. The ability for interagency communication, such as communication between school buses, sheriff patrol cars, City police cars, City public works vehicles, City utilities division vehicles, and emergency vehicles, greatly enhances public health and safety, especially during an emergency situation.

***Hurricane Evacuation Study.*** The Southwest Florida Regional Planning Council, of which the City is a member, updated the *Hurricane Evacuation Study* as part of a statewide evacuation study, in 2010. The study includes evacuation information such as shelter listings, evacuation routes, and clearance times. It provides an updated Sea, Lake and Overland Surges from Hurricane (SLOSH) Model, produced in conjunction with the Atlantic Oceanic Meteorological Laboratory. The SLOSH Model includes inundation maps showing hurricane surge limits for Sarasota County, including the City of Sarasota, increasing the City and County's ability to warn residents in high-risk areas.

### **Public Health**

A flood can devastate residential homes, commercial property, environmentally sensitive lands, and other public infrastructure. However, during the flood and its aftermath, there are also threats to the community's health and safety. Although most attention is normally paid to the risk of physical property damage during and after a flood event, citizens must take precautions to lower the associated health risks. Health risks can be found in many forms, and are not limited to:

- Unsafe food
- Contaminated drinking and washing water
- Poor sanitation
- Domestic and wild animals
- Mosquito borne diseases
- Mold and mildew
- Carbon monoxide poisoning
- Structure electrical and natural gas
- Mental stress and fatigue

Restoring flooded properties is an overwhelming task, and everyone should be cognizant of the potential health risk and associated hazards. Residents should seek assistance from professional sources or their public safety officials.

### **Critical Facilities and Infrastructure**

The City of Sarasota Emergency Management Department has identified 42 government, educational, medical, and electrical critical facilities with the jurisdiction. Information regarding the preparedness, response and recovery activities of these facilities can be found in the City's Flood Warning & Response Plan. Mitigation activities relating to the critical facilities can be found in the Sarasota County Unified Local Mitigation Strategy Plan.

## **Community Economy and Major Employers**

The City of Sarasota is an internationally recognized destination known for its arts and cultural excellence, exceptional healthcare facilities, premier educational institutions, diverse recreational opportunities and the vibrancy of its downtown. Sarasota's economy is driven by education, arts, tourism, and financial services. Major Private Employers include; Publix, Pines of Sarasota, Ringling College of Art and Design, Sarasota Family YMCA, and Mote Marine Laboratory & Aquarium. Major Public Employers include: Sarasota County Government, School Board of Sarasota County, Sarasota Memorial Hospital, City of Sarasota, and the John and Mable Ringling Museum.

## **Natural and Beneficial Functions within the Floodplain**

### ***Wetlands***

A wetland is defined in 373.019(27), Florida Statutes as “areas that are inundated or saturated by surface or groundwater at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Unlike Sarasota County and some other areas of the state, the City is essentially urbanized and developed. Therefore wetlands are not as abundant in the City. However, it is important that the City protect wetlands and the natural function of wetlands through coordination with the private sector, other units of government and the Sarasota Bay National Estuary Program (SBNEP).

### ***Beach and Dune Systems***

The City's beaches protect upland infrastructure and buildings and provide critical habitat for many species including sea turtles and birds. In addition to being a significant natural resource, the beaches are also an important recreational facility for residents and tourists, which is essential to the area's economy. The beach runs the entire three (3) miles of Lido Key with a dune system along the majority of this length. There are over 500 parking spaces within walking distance of Lido Beach. A need for additional parking has not been identified. The Gulf side of Lido Key has experienced severe erosion at various times, in which portions of the beach did not exceed 10-feet in width, and the City works with the Army Corps of Engineers and Florida Department of Environmental Protection to protect the beach. If it had not been corrected, it would have had a significant negative impact on the economy of the City and Sarasota County. In 2015, the City completed a 1.8 mile stabilization project for Lido Beach which replaced sand that was lost due to Tropical Storm Debby in 2012. The Post-Tropical Storm Debby Lido Beach Renourishment Project added 197,000 cubic yards along the 1.8 miles of Lido Beach from the Lido pool to Ted Sperling Park. The project added approximately 85 feet width of beachfront along the affected areas.

Beaches are dynamic systems that constantly shift in response to wave action, tides, and winds. Dune systems buffer upland property and also provide support to numerous plant and animal species. Development along beach systems and inlets interrupt the natural movement of the sand. Shoreline hardening structures may protect the beach areas on which they were built, but beach areas near these structures generally experience

scouring of beachfronts. For this reason, the City and the State regulate shoreline hardening.

Beaches also provide habitat for sea turtles with nesting season running from May through October on the Gulf coast. Sea turtles are protected by both the Federal Endangered Species Act and the Florida Marine Protection Act. It is illegal to touch or disturb nesting sea turtles, hatchlings, or their nests.

Lido Key is the only active beach/dune system within the City limits. According to the 1984 Southwest Florida Ecological Characterization Atlas, U.S. Department of the Interior, the northern half of Lido Key experiences erosion at the rate of one foot per year and is known to be unstable. The southern half of Lido Key generally experiences build-up but also encounters severe erosion at times. This data is based on the regression of the mean high water line expressed in feet/year and was calculated by periodically reviewing shorelines using aerial photography or U.S. Army Corps of Engineers high-water-shoreline-change charts. The measurements are of limited use, however, because they can indicate considerable regression while no net sand loss occurred.

### ***Mangroves***

Mangroves occur along extensive portions of the shoreline of Sarasota Bay. Two species with specialized root systems grow in the intertidal environment, and two more species grow near the shore at higher elevations. Well-established mangrove forests can protect shorelines during episodes of erosion, and buffer uplands from storm surges. They filter upland pollutants, and in doing so serve as valuable nutrient stores and sources.

In 1989, the City adopted a Tree Protection Ordinance providing protection for trees of four and one-half inches in diameter or larger, palms with greater than 8 feet of clear trunk and all species of mangroves. A permit is required for removal of these trees. Removal is allowed only when a tree creates a safety hazard, utility problem, prevents reasonable access, is dead or diseased, or prevents the reasonable development of property. In addition, the regulations provide protection for trees during construction. The Florida Department of Environmental Protection issues permits for trimming or removing mangroves.

### **Development, Redevelopment and Population Trends**

The City of Sarasota is essentially built-out, meaning there are no large vacant tracts of land such as those found in Sarasota County outside of the City. Therefore, the City population is not expected to grow rapidly as a result of new development. During the past 15 years, a great amount of redevelopment has occurred in the central core of the City's downtown. Large condominium buildings have replaced older and, in most cases, smaller structures. This redevelopment has increased the downtown's population and this trend is expected to continue in the future. Additionally, increases in the City population could result from annexation of areas of unincorporated Sarasota County. It should be noted that any annexed lands are likely to already be developed; therefore the population increase resulting from annexation will not be from new development, but rather a "transfer" of the status of the people as residents of unincorporated Sarasota County to residents within the limits of the City of Sarasota.

Much of the development that has been occurring in the City in recent years and will be seen in the future consists of the razing of existing buildings and the construction of new ones. This has been particularly true with waterfront properties and those located near the water, such as on Bird Key, Lido Key, and elsewhere along Sarasota Bay and the Gulf of Mexico in “A” and “V” flood zones. Many homes have been purchased for the purpose of being razed and a new home being built. Many of the homes being demolished were built prior to any requirement to elevate structures or meet any flood prevention regulations. The new homes being constructed have to meet all flood development regulations such as the first finished floor being elevated to a certain level, requiring hydrostatic flow-through openings in walls, breakaway walls if located in a “V” flood zone, and locating equipment such as water heaters, air handlers, etc. above the base flood elevation. Being constructed to meet all of these standards should result in less flood damage to these structures as compared to the ones they replaced. In addition to meeting requirements to develop in an “A” or “V” flood zone, new homes and other buildings being constructed also have to comply with the latest building code requirements with regard to wind and hurricanes.

### **Economic Impact on Future Flooding**

The amount of economic impact by flooding and its duration depends on the severity of the storm event. A storm event with heavy rain and little wind may only result in flooding in a limited area of the City and would have relatively little long-term economic impact. Conversely, torrential rains, along with high winds and storm surge associated with a Category 4 or 5 hurricane could result in citywide damage and mid to short-term financial impacts. Based on the assumption of a catastrophic storm, property tax revenue would decline severely in the year following such a storm. The return of property tax revenues to pre-storm levels would depend on how quickly structures are rebuilt. The City reserve funds would need to be drawn upon to pay for damages to City property, rent temporary office space, and replace lost revenues. Franchise and Excise fees from electric, natural gas and communication fees would drop until such time as the damaged areas are rebuilt and these services restored. However, at the same time the subsequent receipt of disaster assistance, clean-up and recovery activity, and the production of replacement capital will serve to act as a counterweight to some losses. Also the City’s loss of property is insured and payments to reimburse the City will be forthcoming. Building permit revenues, which are not included in the General Fund, would soar in the months following such a storm as insurance claims are settled and property owners begin the process of rebuilding structures. The sales tax revenue generated from purchases of supplies and replacement goods (e.g. lumber, plumbing fixtures, furniture, appliances, electronics) may offset in part the loss of sales tax revenue from a drop in tourism and visitors to the City due to the storm. Another economic factor to consider is the fact that studies have shown the employment in Florida drops between 1% - 1.5% in response to hurricanes as well as residents leaving the City temporarily.

### **FLOODPLAIN PROGRAM GOALS**

- Increase public awareness of known flood hazard areas, availability of flood insurance, and flood protection methods.
- Increase publicly owned natural areas within flood prone areas.

- Provide adequate warning to residents of storm events, impending floods and other natural disasters.
- Protect environmentally sensitive lands from development.
- Eliminate or reduce stormwater system levels of service deficiencies in the 12 drainage basins located in the City.
- Prevent increased water runoff from new development, which could result in increases flood flows.

## **REVIEW OF CURENT ACTIVITIES**

### **Preventative**

#### ***Engineering Design Criteria Manual***

The City's "Engineering Design Criteria Manual" addresses stormwater attenuation requirements for all new subdivisions and other multi-family developments within the City limits. Attenuation is a design principle whereby additional stormwater run-off created by development is controlled so that it does not increase the probability of flooding either upstream or downstream property owners. Adequate retention areas and controls are engineered so that the rate of discharge into the receiving body is not increased. Run-off reduction enhances the ability of precipitation that falls on land surfaces to be absorbed by the soil (infiltration), thus recharging the groundwater supplies.

#### ***Stormwater Environmental Utility***

In 1989 the City and Sarasota County Government entered into an interlocal agreement creating a "Stormwater Environmental Utility" to comply with the National Pollutant Discharge Elimination System (NPDES) regulations for the management of municipal stormwater. Sarasota County as the lead agency and the City as a co-permittee for this endeavor received one of the first such permits issued. The Utility's responsibilities include administration, basin planning, operations, maintenance, repair, and capital improvements to the stormwater system.

#### ***Beach and Dune Maintenance***

In January 1990, the City Commission authorized the preparation of the Lido Beach Long-Range Beach Management and Erosion Control Plan. As part of that plan, an analysis was made of the littoral processes affecting the key. This included researching and summarizing the range of wind and wave conditions and the effects of the seven major extra tropical storms, which had affected the area since the 1920's. A sediment budget (inventory of sand gains and losses) was developed to examine sources of sand, and transport rates and directions. Littoral drift rates (the rate at which sand moves along the coast) along Lido Key were estimated by studying the rates that sand builds up at

Sarasota County inlets and passes. Various authors based on shoaling/dredging records at the passes have inferred net rates of 28,000 to 50,000 cubic yards per year. This data was used to calibrate a computer model for calculation of sediment transport, which was then used in subsequent analyses. The effects of wave transformation by the ebb shoals of the passes were also considered and the model results were compared with historical shoreline changes identified from previous surveys. The final sediment budget confirmed the existence of a “nodal point” in the area of the public beach in the center of Lido Key. The significance of this is that sand transport patterns indicate erosional losses in both directions (north and south) from the public beach. According to the City Engineer, in 2015 the southern portion of Lido accretes sand while the north portion remains stable.

The Lido Beach Long-Range Beach Management and Erosion Control Plan, completed in January of 1991, recommended an initial beach renourishment of 350,000 cubic yards with subsequent renourishments of 200,000 cubic yards approximately every four years, all placed along approximately one mile of publicly accessible beach on central Lido Key. The initial beach fill width of approximately 155-feet (with a gradual taper extending over the southern 1400 feet) resulted in a 75-foot design beach width to be maintained for a 50-year period. This work was to be in addition to and alternating with the fill placed by the U.S. Army Corps of Engineers (USACE) via their New Pass channel maintenance project every four years. This alternating and periodic renourishment process is necessary because of the designed, sacrificial loss of sand, due to natural effects. The City Commission approved the Plan, after several public hearings and great support from the citizens. The City Commission authorized the multitude of necessary studies for the design of the initial project in August of 1991. The City applied for a State grant for construction of the Long-Range Plan’s initial fill through the Florida Beach Erosion Control Program for fiscal year 1997-98. The 1997 State Legislature recommended funding of the project to the Governor in the amount of 15 percent. The project was constructed in April 1998.

New Pass at the north end of Lido Key was dredged in 1982 and 1990-91 and the spoil used in a beach renourishment project along Lido Key and Longboat Key. The U.S. Army Corps of Engineers dredged new Pass in the summer of 1997 and approximately 160,000 cubic yards of spoil was deposited on Lido Key along the beach from John Ringling Boulevard, southward. Another 160,000 cubic yards of spoil was placed on Longboat Key, north of the channel. Dredge disposal sites are discussed below.

The southern third of Lido Key experienced severe erosion during the first half of 1998 and the September 1998 storms. Condominium owners and resort owners became well organized and requested help from the City of Sarasota. On March 2, 1998, the City Commission approved an Agreement for Engineering Services with Coastal Planning and Engineering, Inc. (CPE) to accomplish the engineering and permitting, including the sand search. A sand source was identified by CPE about eight miles offshore, directly west of Lido Beach.

To protect the shoreline and back dunes on Lido Beach, Sarasota County has constructed wooden dune crossovers to the beaches to allow the back dunes a chance to develop a vegetative cover. A dune cross over is essentially a footbridge so pedestrians will not walk on and damage dune vegetation. Natural forces destroyed several dune crossovers in the last few years. They have been or will be replaced with “at-grade” access points and the new dune will be revegetated.

As they did for the 1998 Lido Beach Restoration Project, the Florida Department of Environmental Protection (FDEP) required the establishment of an "Erosion Control Line" (ECL) for this project. The City Commission approved the ECL on 4 December 2000 and the document was recorded with the County Clerk on 17 January 2001. Drawings showing the exact location of the adopted ECL are in our office for public review.

During March and April of 2001, Weeks Marine placed approximately 360,000 cubic yards of sand on the southern half of Lido Beach, a distance of 1.3 miles. The sand source was about 8 miles west of Lido Beach, under 35 feet of water. The total cost of this project was \$4.18 million.

The USACE had New Pass dredged again in 2003. Goodloe Marine, Inc. started dredging New Pass and placing some sand on Lido Beach on December 15, 2002. At the recommendation of City Engineer and CPE, on April 15, 2002, the City Commission approved the plan to place the "white" sand on the entire southern two-thirds of the island, as a two-foot thick layer, approximately one hundred feet wide. Goodloe completed the Lido Beach portion on February 1, 2003, placing approximately 125,000 cubic yards and continued dredging New Pass and placing the other half on Longboat Key's beach. The New Pass maintenance program currently reached its cap for federal funding.

On 22 December 2004, the Chief of Engineers of the USACE signed the "Feasibility Study for Hurricane and Storm Damage Reduction for Lido Key" culminating the 3-year study by the USACE. The next steps in order of needed action, which will take many months, are:

1. Office of Management and Budget (OMB) clears Feasibility Study and submits to Congress.
2. Congress authorizes increased project cost via the next Water Resources Development Act (WRDA) bill.
3. Authorization to proceed under authority of Section 206 approved by Assistant Secretary of the Army.
4. USACE prepares, City executes and USACE executes Project Cooperation Agreement (PCA).
5. Congress authorizes construction financing.

Items 1, 2, and 3 have been completed. In addition to the long range Lido Beach project, the "FEMA" project was completed in early 2009. The agreement for the design of Lido Beach for the next 50 years was approved by the City Commission in August of 2006 and is presently underway by the USACOE.

In January 2005, Sarasota County awarded a contract to a coastal engineering firm to prepare inlet management studies for both New Pass and Big Sarasota Pass.

In June 2012, Tropical Storm Debby produced severe erosion on Lido Beach. Receiving funding from the FEMA, FDEP, and the Tourist Development Tax, in 2015 the Post-Tropical Storm Debby Lido Beach Renourishment project added 197,000 cubic yards of sand from New Pass to Lido Beach. CB&I (formerly CPE) was hired as the coastal



engineering consultant, and Orion Marine Group was hired as the contractor. The total cost of the project was approximately \$3.6 million.

The City continues to receive grant funds from Sarasota County's Tourist Development Tax fund and from the Florida Department of Environmental Protection's Beach Erosion Control Program.

In 1989 the Florida Department of Environmental Protection relocated the Coastal Construction Control line (CCCL) further inland in Sarasota County in response to general erosion trends. Development seaward of the CCCL is required to meet more stringent construction standards to help protect development in highly dynamic areas.

Development in the coastal area is generally subject to more stringent regulation than other areas in order to minimize the risk to life and property if a disaster were to occur. The City is bound by regulation at the federal, state and local levels that provide mitigation measures for coastal development.

### ***Coastal Construction Control Line***

The State of Florida addresses coastal development in Chapter 161.053, Florida Statutes, which is administered by the Florida Department of Environmental Protection (FDEP), Rule 62B-33, Florida Administration Code. The statute establishes a Coastal Construction Control Line (CCCL) defined as that portion of the beach-dune system which is subject to severe fluctuations based on the 100-year storm surge, storm waves, or other predictable weather conditions. Development seaward of the line is subject to FDEP review to ensure that coastal construction minimizes the adverse impacts to beach-dune systems and adjacent property and is designed to meet hurricane resistance building standards. Chapter 162.053, F.S., also establishes the 30-year erosion projection line, which is the projected location of the seasonal high water line on subject property 30 years following submittal of an application for a permit. No major structures are eligible to receive a permit seaward of the 30-year erosion projection line except single-family dwellings meeting specific site requirements.

### ***City of Sarasota Regulation of Development in Special Flood Hazard Areas***

Within the City of Sarasota, development in the coastal areas as well as all Special Flood Hazard Areas, is regulated by the Florida Building Code (FBC), Chapter 16, the Florida Building Code Residential (FBCR) Chapter 3, and the American Society of Civil Engineers–ASCE-24-Standard as referenced by the Florida Building Code (FBC) and the Florida Building Code Residential (FBCR).

In addition, the City of Sarasota has a Floodplain Management Ordinance which has procedures and criteria for development in Special Flood Hazard Areas. These areas are defined on the flood insurance rate maps of Federal Emergency Management Agency, and include all V and A zones of these maps.

The purpose of these regulations is to minimize public and private losses due to flood conditions in the Special Flood Hazard Areas. Below are some examples of how the regulations in the aforementioned documents help to minimize flood losses:

- Restrict or prohibit uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities.
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against potential flood damage at the time of initial construction.
- Control the alteration of natural floodplains, stream channels and natural protective barriers which are involved in the accommodation of floodwaters.
- Control filling, grading, dredging and other development which may increase erosion or flood damage.
- Prevent or regulate the construction of flood barriers which will unnaturally divert Floodwaters or which may increase flood hazards to other lands.

Section VI-105 of the Land Development Regulations establishes minimum building finished floor elevation requirements. For most buildings, the minimum finished floor Elevation must be 24 inches above the average elevation of the crown of the road.

### **Property Protection**

Sarasota County acts as the local sponsor on behalf of the repetitive flood loss property owners in the Flood Mitigation Assistance grant program. City of Sarasota property owners are eligible to participate in this program. This mitigation program is offered by the Federal Emergency Management Agency (FEMA) and administered by the Florida Department of Community Affairs (DCA). The program provides grant reimbursements up to 75 percent of the approved project cost for flood proofing projects including building elevation, relocation, acquisition, dry flood proofing, and minor localized flood control structural projects and minor beach nourishment activities. Sarasota County has participated in this grant application program since it was first offered in 1997.

The Building and Zoning Department provides property owners with flood insurance information, Flood Insurance Rate Map (FIRM) information, and information on flood proofing. These activities are discussed below under “Public Information Activities.”

### **Natural Resource Protection**

#### ***Beach Nourishment***

Beach nourishment along the City’s beaches is discussed earlier in this document under “Beach and Dune Maintenance” in the “Preventative” section of current activities.

#### ***Tree Protection Ordinance***

As discussed earlier in this document, well-established mangrove forests can protect shorelines from occasional episodes of erosion, and buffer uplands from storm surges.

To protect mangroves and other trees, in 1989 the City adopted a Tree Protection Ordinance providing protection for trees of four and one-half inches in diameter or larger, palms with greater than 8 feet of clear trunk and all species of mangroves. A permit is required for removal of these trees. Removal is allowed only when a tree creates a safety

hazard, utility problem, prevents reasonable access, is dead or diseased, or prevents the reasonable development of property. In addition, the regulations provide protection for trees during construction. The Florida Department of Environmental Protection issues permits for trimming or removing mangroves.

### **Emergency Services**

Prior to May 2014, the City of Sarasota relied upon Sarasota County Emergency Management to coordinate much of their disaster preparedness, response, and recovery activities through planning documents such as the Hurricane Evacuation Study 2010 and the County's Comprehensive Emergency Management Plan. The County's plans were reviewed amongst the various City Department Directors in order for them to plan their respective department's roles in a County-wide disaster event.

In May 2014, the City of Sarasota created an Emergency Manager position within the Sarasota Police Department to focus on the direct needs of the City and to coordinate activities prior to, during, and after a disaster with Sarasota County. While the position continues to expand, the primary duties of the position are:

- Serves as the City's Incident Commander during a "State of Emergency".
- Serves as Co-chair of the Floodplain Management Committee.
- Serves on the Sarasota County Local Mitigation Strategy Work Group.
- Responsible for all emergency related planning activities.
- Responsible for all emergency management training activities.
- Maintains the City's Emergency Operation Center.
- Coordinates emergency response and recovery activities with surrounding jurisdictions and agencies.

The creation of this position enables the City to more effectively and efficiently respond to the needs of our residents during a disaster and the damage that may follow.

### **Structural Projects**

#### ***Shoreline Protection Structures***

There are approximately 40 miles of coastal shorelines within the corporate boundaries of the City of Sarasota. Of these 40 miles, approximately 8 miles are in a natural state and 32 miles have been altered by some type of man-made structure. The City regulates shoreline hardening through the Zoning Code.

## ***Stormwater Infrastructure***

In 1998 the City of Sarasota and Sarasota County entered into an interlocal agreement whereby all stormwater management services are consolidated under the control of Sarasota County. Current, future, and maintenance needs are identified in various master plan studies, such as replacement of aging pipes, upgrades to under capacity systems, and provide outfall to landlocked basins. Additional, up-to-date information on water quality and stormwater master plans can be found at the following website: <http://www.sarasota.wateratlas.usf.edu/>.

## **Public Information Activities**

### ***Informational Flyers, Articles, and Internet Site***

The City of Sarasota provides information to the public about flooding. Annually, an informational flyer is included in water utility bills which discuss flood hazard areas, flood warnings, flood safety, flood insurance, property protection measures, floodplain development permit requirements, and other helpful information.

Information flyers concerning preparedness, response, and recovering from flooding events and evacuation information may be found in the following locations, Sarasota Police Department Headquarters, City Hall, and the Utility Bill Pay Center. Additional information is also available in the Building Department regarding development requirements in the various flood zones, and the regulations concerning the remodeling or improvement of structures which do not meet the minimum finished floor requirements because they were built prior to such regulations.

The City of Sarasota maintains a web site accessible via the Internet. A link for flood information and safety is available on the City of Sarasota home page at [www.Sarasotagov.com](http://www.Sarasotagov.com). Links are also provided to connect visitors to other web sites which provide flood information.

### ***Flood Insurance Rate Maps***

The FEMA Flood Insurance Rate Maps (FIRM) are available in the Building and Zoning Department. The boundaries of the flood zones on these maps have been placed on the quarter-section maps of the City, enabling property owners, residents, developers, and insurance agents to determine what flood zone a specific property is located in. They can view the maps in person or, as many insurance agents do, call and ask Zoning Department staff for the information.

The City of Sarasota has been participating with the Southwest Florida Water Management District (SWFWMD), Sarasota County, and other jurisdictions in Sarasota County in the updating of the Flood Insurance Rate Maps from paper to digital.

Jurisdictions within Sarasota County also utilize the Local Mitigation Strategy Work Group to address, assist, and collaborate with one another on regulations and the flood map updates.

### ***Flood Protection Assistance***

The City of Sarasota Zoning Office provides information on required minimum floor elevations, data on historical flooding in the City, and other information relating to flood threats in the City. The Building Department can also provide the names of licensed and registered contractors, and information as to the appeal process should someone be dissatisfied with a contractor's performance. Building Department staff are available to make site visits to advise of appropriate flood protection measures for both new and existing buildings, and can lend assistance in reviewing retrofitting plans for existing structures.

***The following Sarasota City Plan Action Strategies pertain to one or more of the six previous activity categories:***

The following action strategies are from the Utilities Chapter of the Sarasota City Plan:

- 1.7 **Stormwater Drainage:** The City shall require development to provide facilities for stormwater drainage in accordance with the Engineering Design Criteria Manual and in accordance with the requirements of Florida Administrative Code, Chapter 62-25.
- 1.8 **Stormwater Drainage Level-of-Service:** The stormwater drainage system shall provide adequate capacity to maintain level-of-service C (Street and Yard Flooding only) using a 25-year/24-hour design storm.
- 1.9 **Sarasota County Storm Water Fee Proceeds:** Proceeds from the Sarasota County Storm Water Utility fees shall be used for maintenance, planning, elimination of structure flooding, and the reduction of pollutants carried by stormwater runoff into Sarasota Bay.
- 1.10 **Drainage System Improvements:** The City shall work with the Sarasota County Stormwater Environmental Utility or develop and fund its own stormwater utility to:
  - Complete Basin Master Plans,
  - Evaluate the recommended improvement to the drainage System to correct existing deficiencies as identified in each Basin Master Plan, and
  - as the funds are available will consider implementing the improvements.
- 1.11 **Development:** Development shall be subject to the availability of adequate levels of service for potable water, sanitary sewer, solid waste, and drainage, pursuant to the relevant action strategies of the Capital Improvements Chapter.

- 2.2 **Environmental Protection From Stormwater Runoff:** The quality and quantity of storm water runoff shall be regulated in accordance with:
- Chapter 17-25 Florida Administrative Code;
  - Environmental Resource Permitting of Surface Water Management Systems, administered by the Southwest Florida Water Management District, (Chapters 40D-4, 40D-40, 40D-45 and 40D-400 Florida Administrative Code);
  - National Pollutant Discharge Elimination Permit No. FLS000004; and
  - The City’s Engineering Design Criteria Manual (EDCM), Chapter 29.5, Ordinance 89-3278, in order to protect the quality of receiving water bodies. The EDCM will continue to require that any new development not be allowed to shed storm water at a higher rate onto adjacent right-of-way or property than was discharged from the site in its prior existing state.
- 2.6 **Permeable Surfaces:** The Engineering Department shall explore the use of permeable surfaces as an alternative to impervious pavement surfaces to minimize runoff.
- 3.3 **Stormwater Management:** The City will explore alternatives to balance redevelopment efforts and site specific stormwater management requirements.
- 3.4 **Regional Stormwater Management:** In recognition of the desires to improve watershed management while promoting continued urban development and redevelopment, the City shall investigate the feasibility of utilizing aggregate and/or regional stormwater management facilities.

The following action strategies are from the Environmental Protection and Coastal Islands Chapter of the Sarasota City Plan:

1.3 **Specific Natural Resource Protection Initiatives**

**Water:** In addition to regulations listed in this action strategy, the City will continue to support and comply with all applicable county, state and federal laws to protect water.

**Stormwater Runoff:** The quality and quantity of storm water runoff shall continue to be regulated in accordance with the “Engineering Design Criteria Manual” in order to protect the quality of receiving water bodies.

- 1.5 **Specific Natural Resource Protection Initiatives – Wetlands:** The City will continue to support and comply with applicable regulations which protect wetlands. The applicable regulations shall include, but not be limited to, the most recently adopted and applicable documents, as may be amended, listed in Action Strategy 1.1 of this Environmental Protection Plan; Chapter 373, Florida Statutes; and Chapters 62-4, 62-40, 62-302, 62-340, and 62-342, Florida Administrative Code.
- 3.6 **Impervious Surface Area:** The City shall continue to explore reducing the amount of existing impervious surface in the Sarasota Bay watershed and seek alternatives for reducing impervious surface area in future development.
- 3.8 **Impervious Surface on Coastal Islands:** The City shall further evaluate the reduction of impervious surfaces for sites located on the coastal islands. Impervious surfaces shall be minimized to the maximum extent feasible, especially for parking surfaces.
- 4.1 **Development and Evacuation:** The City shall ensure that future development within the Coastal High Hazard Area does not occur in amounts, types, or locations that would cause total evacuation time to exceed those established by the City’s “Peacetime Emergency Plan” (a.k.a. Comprehensive Emergency Management Plan) which shall not exceed more than 16 hours.
- 4.2 **Storm Damage Minimization:** The potential for storm damage shall be minimized through compliance with applicable Land Development Regulations including but not limited to:
- Florida Building Code (2004);
  - Coastal Construction Code;
  - Sarasota Zoning Code, which:
    - Regulates construction in the high wind areas using the standard for hurricane resistant construction SSTD 10-93;
    - regulates areas of special flood hazard;
    - regulates properties in the Marine Park zone, by requiring special approvals for any use which could have any negative impact or cause erosion or environmental damage, such as flooding; protects beach and dune alteration through regulations requiring special permitting procedures for properties within the 150 foot gulf-front setback. These regulations require property owners to establish that proposed changes:
      - ⇒ will not endanger the stability of the beach-dune

system;

⇒ will not accelerate erosion;

⇒ obtain advance approval from the Florida Department of Environmental Protection;

◇ encourages the use of dune walk-over systems to preserve vegetation and the dunes;

◇ uses conservation districts as overlay zones to protect land uses in certain environmentally sensitive areas including coastal areas, beaches, dunes and marshes;

- Engineering Design Criteria Manual, which mandates stormwater attenuation and requires that external drainage systems shall be built to the 25-year/24-hour storm event; and,
- Operational provisions to recover from damage caused to the sanitary sewer system caused by severe storms.

4.3 **Federal Emergency Management Act (FEMA):** The City will continue to participate in the Federal Emergency Management Act Community Rating Systems (CRS) Program, which involves meeting higher than minimum FEMA standards. The CRS program includes but is not limited to:

- the City's adopted flood plain management program which deals with strategies to lessen flooding and respond to emergencies; and
- annual reports to the CRS Program on the City's progress, and effects of any storms.

4.5 **Peacetime Emergency Plan** (a.k.a. Comprehensive Emergency Management Plan): The City shall employ the hazard mitigation annex of The Peacetime Emergency Plan, the purpose of which includes, but is not limited to:

- assigning responsibilities and establishing procedures for governmental agencies, volunteer agencies, and individuals, in preparing for and executing evacuation of designated areas of Sarasota;
- relocation of coastal residents, residents of mobile home parks, and residents of low-lying areas subject to flooding; and
- providing maximum warning time possible to residents of those areas which are deemed to be in danger.

4.6 **Coastal Property Acquisition:** The City will consider measures, including the acquisition of coastal property subject to frequent damage during natural disasters, to



future disasters.

- 4.7 **Post-Disaster Redevelopment Plan:** Immediately following each major disaster, the City shall evaluate the Damage Assessment Team and Damage Survey Team reports (as required by the Peacetime Emergency Plan) and develop a specific post-disaster redevelopment plan in coordination with the Sarasota County Department of Emergency Management. The intent of the post-disaster redevelopment plan will be to repair damaged infrastructure needed for health and safety; to coordinate long term recovery operations to City infrastructure and public structures; and aid the City's economy to return to pre-disaster competitive status. The plan will include funding and staffing estimates, set priorities for post-disaster efforts, and develop criteria for deciding the order of importance in which the elements of the City's economy are to be aided.
- 4.8 **Public Fund Expenditures In Coastal High Hazard Area:** Prior to locating new public facilities or public infrastructure in the coastal high hazard area (CHHA), alternative locations outside of the CHHA shall be explored and evaluated. The expenditure of public funds on infrastructure in the CHHA shall be limited to:
- New public facilities and public infrastructure which can not feasibly be located outside of the CHHA;
  - Restoration, maintenance, enhancement, relocation, mitigation, or replacement of the following;
    - ◇ Natural resources;
    - ◇ Passive recreation facilities;
    - ◇ Facilities and uses which further the land uses on the Future Land Use Map;
    - ◇ Facilities necessary to ensure the health, safety, and welfare of the public or sustain the financial integrity of the City. Examples of such facilities include, but are not limited to: Police stations, fire stations, medical facilities, bridges, roads, public rest rooms, performing arts centers, and auditoriums.
- 4.10 **Minimizing the Risks of Natural Disasters:** The City will coordinate with Sarasota County in the development of a Local Mitigation Strategy (LMS) as outlined by the Florida Department of Community Affairs, for the purpose of minimizing the risks of natural disasters. The LMS will include an assessment of vulnerabilities to natural disasters and mitigate initiatives to minimize risks. The City will adopt appropriate LMS initiatives upon completion of the LMS.
- 4.11 **Renourishment of the City's Beaches:** The City shall pursue grants and other funding sources to assist in the renourishment of the City's beaches for the protection of public and private property.

- 4.12 **Passive Recreation:** The City encourages that recreational activities on and adjacent to beaches minimize impacts to natural resources and the environment.
- 4.13 **Coastal Construction Control Line:** The City shall not issue permits for structures seaward of the Coastal Construction Control Line (CCCL) that do not have the appropriate permit(s) issued by the Florida Department of Environmental Protection unless the structure is exempt from the requirements of Chapter 62B-33, Florida Administrative Code.
- 5.1 **Evacuation:** The City shall cooperate with Sarasota County through the Peacetime Emergency Plan to:
- ensure orderly evacuation in the event of a natural disaster,
  - reduce evacuation times in conjunction with the Sarasota County comprehensive plan; and
  - increase the amount of shelter space available;
  - periodically review the city-wide Emergency Plan.
- 5.2 **Law Enforcement After Storm Events:** After passage of a storm event, the City's Police Department shall provide sufficient law enforcement patrols to safeguard property in evacuated locations.

## **REVIEW OF POSSIBLE ACTIVITIES**

### **Preventative**

The Floodplain Management Plan (FMP) Committee discussed the use of permeable surfaces as an alternative to impervious pavement surfaces to minimize runoff. There continues to be inquiries from the development community and property owners about using materials for parking, sidewalks, and other similar uses that allow water to percolate down through them into the ground, unlike traditional concrete and asphalt surfaces. One of the concerns about permeable surfaces is the durability. However, the Committee decided that the possible use of permeable surfaces is worth investigating and Action Plan item #1 and #15 was created to determine if permeable surfaces are feasible. It was determined that these should be reviewed on a project-by-project basis when proposed by the developer and/or City Staff.

One of the concerns of residents and property owners is the coverage of zoning lots with impervious surfaces area such as sidewalks, decks, and patios. On April 29, 2002, the City Commission adopted updates to the City's Zoning Code, which included maximum impervious surface coverage requirements in Residential Single-Family zone districts. The requirements apply to single-family zone districts throughout the City and limit the amount of impervious surface coverage allowed.

The FMP Committee discussed the City's participation in the Community Rating System (CRS) and the current regulations administered by the City that minimize flood and storm damage. It was felt that the existing regulations have served the City well and that no additional regulations were necessary at this time. Action Plan items #4 and #5 provide for

the continued enforcement of applicable regulations to minimize flood and storm damage, and continued participation in the CRS program.

Development in the Coastal High Hazard Area (CHHA) was discussed, and the location of public facilities or public infrastructure in the CHHA. The Committee established Action Plan item #8 to coincide with the Action Strategy in the Sarasota City Plan to consider alternative locations outside of the CHHA for such facilities, but not require that they be. The FMP Committee realized that in some cases the most appropriate or strategic place for a facility is in the CHHA. An example would be a fire station located so as to provide an acceptable response time.

### **Property Protection**

The FMP Committee discussed the acquisition, relocation, and retrofitting of structures in the floodplain, in particular those structures which have been subject to repeated flooding. Sarasota County has a CRS Coordinator whose position is partially funded by property owners in the City of Sarasota. The County CRS Coordinator pursues grants for flood mitigation assistance, including retrofitting, relocation, and acquisition. Rather than duplicating pursuit of grants with City of Sarasota staff, it was determined by the FMP Committee that City staff should determine potential candidate structures for such grants in conjunction with the Sarasota County CRS Coordinator. The Sarasota County CRS Coordinator could then include such structures in any eligible grant applications Action Plan item #9 addresses this approach to reducing flood damage to structures.

### **Natural Resource Protection**

The FMP Committee determined that no activities in addition to those currently being done (as discussed earlier in this document) were necessary with regard to natural resource protection.

### **Emergency Services**

The FMP Committee felt that existing City's Emergency Management Program adequately address measures taken during a flood to minimize its impact. Action Plan item #6 specifies what will occur following a disaster should one occur.

### **Structural Projects**

Providing stormwater facilities on each individual site can consume a sizeable portion of a small development site, such as those found in the downtown area, and make it difficult to meet other regulations such as parking. If provided for in a development agreement, several properties can share a stormwater management facility, although this is rare. New zone districts, and new development regulations for these zone districts, were created for the downtown area, which will change the way these properties are developed, including how water run-off from a site will be designed. The rezoning of the downtown area affecting some 2000 properties was effective in the fall of 2005. The FMP discussed this issue and created Action Plan item #3 to see if such aggregate facilities are feasible.

The Basin Master Plan studies were discussed and that work on these studies should continue as part of the ongoing work program, resulting in Action Plan item #2.

Beach renourishment projects and their cost were discussed by the FMP Committee, and it was determined that the Neighborhood and Development Services Department should consider which grants or funding sources, if any, should be applied for to assist with such projects. Action Plan item #7 addresses pursuit of such grants and funding sources.

### **Public Information**

The FMP Committee considered public information activities to advise property owners, potential property owners, and builders about flood hazards and ways to protect people and property from such hazards. The FMP Committee thought that the City should continue to send out an informational brochure on flooding to all property owners in the water utility bills each year, not just those located in the floodplains. While there was discussion on the possibility of just mailing to those located in the floodplains, it was determined that it was better to educate as many residents and property owners as possible about flood hazards and prevention. Action Plan item #10 was created to ensure that this informational brochure will be mailed annually.

Accuracy of information on flooding, flood hazards, warnings, flood insurance property protection measures, and flood protection assistance was also discussed. Residents, property owners, and members of the development community appear to take advantage of such information as there are many inquiries to the City, particularly the Building and Zoning Department on such topics. It was determined by the FMP Committee that keeping this information up-to-date and accurate was very important, and relatively inexpensive to do. Action Plan item #11 was prepared to make sure this information is accurate and timely.

Since flooding and flood related issues transcend the boundaries of the city limits, it is important that the City of Sarasota participate with surrounding jurisdictions in flood prevention and public outreach activities. The Sarasota County Unified Local Mitigation Strategy (LMS) Work Group, of which the City of Sarasota is a member, meets and one of the issues they discuss is flooding and public outreach. As such, Action Plan item #12 was created to ensure continued participation with these groups.

There is currently a Map Modernization project underway to update the Flood Insurance Rate Map's (FIRM's) for Sarasota County and all jurisdictions in the County, which would include the City of Sarasota. This Map Modernization effort is to modernize the FIRM's into a digital product and update the flood hazard information to reflect the best possible data, and converting from the National Geodetic Vertical Datum 1929 (NGVD 29) to the North American Vertical Datum 1988 (NAVD 88). Action Plan item #13 and #14 was created by the committee regarding this project.

### **ACTION PLAN**

1. The Neighborhood and Development Services Department shall continue to evaluate the use of permeable surfaces as an alternative to impervious pavement surfaces to minimize runoff.

Action: On a project-by-project basis, when proposed by developers or property owners, the Neighborhood and Development Services Department shall evaluate the feasibility of permeable surfaces to minimize runoff.

Budget: Staff time (Operating funds)

2. The City shall work with the Sarasota County Stormwater Environmental Utility to complete Basin Master Plans, evaluate the recommended improvements to the drainage system to correct existing deficiencies as identified in each Basin Master Plan, and as the funds are available will consider implementing the improvements.

Action: As an ongoing part of the work program, the Public Works Department and Neighborhood and Development Services Department shall work with the Sarasota County Stormwater Environmental Utility to make drainage system improvements. This shall include drainage system maintenance, planning, elimination of structure flooding, and the reduction of pollutants carried by stormwater runoff into Sarasota Bay.

Budget: Staff time (operating funds and revenues from the Sarasota County StormWater Utility assessments.)

3. The City shall investigate the feasibility of utilizing aggregate and/or regional stormwater management facilities to reduce the resultant land consumption on individual sites, while improving the overall system efficiency.

Action: On a project-by-project basis, the Neighborhood and Development Services Department shall determine the feasibility of aggregate and/or regional stormwater management facilities.

Budget: Staff time (Operating funds)

4. The potential for storm damage and flooding shall be minimized through compliance with applicable Land Development Regulations.

Action: As part of its ongoing review of applications for building permits and development approvals, the City shall ensure that such proposals comply with all applicable Land Development Regulations including but not limited to the Florida Building Code, Coastal Construction Code, Sarasota Zoning, and the Engineering Design Criteria Manual.

Budget; Staff time (Operating funds)

5. The City will continue to participate in the Community Rating System (CRS) Program.

Action: Annually the CRS Coordinator will report to the CRS Program on the City's procedures to employ strategies to lessen flooding and respond to emergencies.

Budget: Staff time (Operating funds)

6. The City shall develop a specific post-disaster redevelopment plan and coordinate with Sarasota County and other surrounding jurisdictions as appropriate.

Action: The City will develop a Post-Disaster Redevelopment Plan specific to the needs of the City. The plan will include funding and staffing estimates, set priorities for post-disaster redevelopment efforts, and develop criteria for deciding the order of importance in which the elements of the City's economy are to be aided.

Budget: Staff time (Operating funds)

7. The City shall pursue grants and other funding sources to assist in the renourishment of the City's beaches for the protection of public and private property. (The deadline dates vary from year-to-year)

Action: As part of its annual work program, the Neighborhood and Development Services Department shall consider which grants or other funding sources, if any, should be applied for to assist in beach renourishment projects.

Budget: Staff time (Operating funds)

8. Prior to locating new public facilities or public infrastructure in the coastal high hazard area (CHHA), alternative locations outside of the CHHA shall be explored and evaluated.

Action: Review of proposed development approvals to locate public facilities or infrastructure in the CHHA shall include consideration of alternative locations outside of the CHHA.

Budget: Staff time (Operating funds)

9. The City will consider measures, including the acquisition of coastal property subject to frequent damage during natural disasters, to reduce the exposure of life and property to future disasters.

Action: Annually, the Neighborhood and Development Services Department will review the list of repetitive loss properties, and in conjunction with the Sarasota County CRS Coordinator, determine which properties may be eligible candidates for the Flood Mitigation Assistance grant program.

Budget: Staff time (Operating funds). Funding of acquisition of property would come from the Flood Mitigation Assistance grant program.

10. The Community Rating System Coordinator/Emergency Manager will distribute an informational brochure on flooding to all property owners in the City each year. It will include information on the following topics: flood hazard areas, warnings, flood insurance, property protection measures, and flood protection assistance.

Action: This brochure will be mailed annually in the first half of the calendar year, as an enclosure with water utility bills.

Budget: Staff time (Operating funds)  
Postage (Operating funds)

11. The Community Rating System Coordinator/Emergency Manager will update information available to the public on the following topics: flood hazard areas, warnings, flood insurance, property protection measures, and flood protection assistance.

Action: By September 1<sup>st</sup> of each year, the Community Rating System Coordinator shall review the public information available at City Hall, Police Station, Utility Billing Center, Sarasota County Public Library, and online on the City's web page via the Internet. The information will be updated as necessary.

Budget: Staff time (Operating funds)  
Materials (Operating funds)

12. The City shall be a participating member in the Sarasota County Unified Local Mitigation Strategy (LMS) Work Group.

Action: As part of the ongoing work program, the Community Rating System Coordinator, Emergency Manager and appropriate staff from the City as necessary shall attend LMS Work Group meetings that are held throughout the year and assist as may be required with public outreach activities, reports, and other activities undertaken by the two groups regarding flooding.

Budget: Staff time (Operating funds)  
Materials (Operating funds)

13. The Flood Insurance Rate Maps (FIRM's) shall be updated within Sarasota County, including the City of Sarasota. These maps shall be in a digital format, and be updated using the latest topographical data and the North American Vertical Datum 1988 (NAVD 1988).

Action: By December 31, 2016, the Neighborhood and Development Services Department, working in conjunction with the Southwest Water Management District, Sarasota County, FEMA, and other applicable agencies, shall help complete the FIRM modernization project.

Budget: Staff time (Operating Funds)  
Materials (Operating Funds)

14. The Flood Insurance Rate Maps (FIRM's) for the coastal risk and tidal influenced flood risk areas shall be updated in the Federal Program titled "Risk Mapping". The Risk Mapping update will include the unincorporated areas of Sarasota County and the City of Sarasota. These maps shall be in a digital format, and be updated using 2007 LiDAR with elevations reported in the North American Vertical Datum 1988 (NAVD 1988).

Action: By December 31, 2018, the Neighborhood and Development Services Department, working in conjunction with Sarasota County, FEMA, and other applicable agencies, will meet the federal requirements for public outreach which will include a community and public 90 day appeal and comment period and review by FEMA, followed by adoption to complete the Risk Mapping project.

Budget: Staff time (Operating Funds)  
Materials (Operating Funds)

15. The City shall continue to evaluate the use of permeable surfaces as an alternative to impervious pavement surfaces to minimize runoff.

Action: On a project-by-project basis, City Departments shall evaluate the feasibility of permeable surfaces to minimize runoff.

Budget: Staff time (Operating Funds)  
Project Funding

16. The Pelican Drive Outfall-Hudson Bayou Basin project involves a closed drainage system to address street flooding in the short term. The design will include conveyance system improvements, pipe replacements, and a pipe slip line along South Pelican and South Lime Avenue. A future phase will address FPLOS for structure flooding of four homes. Project does depend on County purchase of railroad right-of-way.

Action: City Departments will maintain coordination with County on project development.

Budget: Staff time (Operating Funds)

## **IMPLEMENTATION AND EVALUATION**

Implementation of the City's Plan will be administered by the Neighborhood and Development Services Department with the assistance of the City's Emergency Manager. The department(s) listed in the Action Plan shall be responsible for overseeing implementation of the Action Plan.

The Plan will be evaluated annually by the Floodplain Management Plan Committee. Any Committee recommendations for adoption, deletions or other changes will be included in an annual report to the City Commission annually prior to October 1<sup>st</sup>.



The report will be prepared by the CRS Coordinator and the Committee. It will provide an overview of the plan and progress accomplished during the previous 12 months towards implementing the Action Plan. Any items not achieved will be specifically addressed in the annual report, and if appropriate, alternative recommendations for action provided. Any recommended amendments to the Plan will be presented to the City Commission for adoption. The annual report will be available to the public and released to the media.