Executive Summary

The experiences of the 2004 Hurricane Season epitomize the importance of better integrating hazard mitigation activities into local comprehensive planning. Residents from all over the state experienced significant damages from Hurricanes Charley, Frances, Jeanne, and Ivan by either winds, tornadoes, surge, or flooding. But this was not the only time that we have experienced natural disaster, nor will it be the last. In 1992, Hurricane Andrew devastated South Florida. In 1998 and 1999, most counties in Florida experienced wildfires. In some cases, despite fire fighters best efforts, the fires advanced through neighborhoods and homes were lost. Every year in Central Florida, new sinkholes emerge swallowing homes and damaging infrastructure. The cost of recovery for these various disasters ranges from hundreds of thousands to billions of dollars, significantly taxing local, state, and federal financial sources. Losses covered through federal funding as a result of the 2004 hurricanes alone could reach as high as $7 billion. Worst of all, however, are the many lives that, directly or indirectly, are lost due to natural disasters. It is imperative that we reduce the human and financial costs of natural disasters. Through better integration of natural hazard considerations into local comprehensive planning, we can build safer communities.

This profile of Pinellas County has been prepared as part of a statewide effort by the Florida Department of Community Affairs (DCA) to guide local governments on integrating hazard mitigation principles into local comprehensive plans. Through the process outlined in this profile, planners will be able to (1) convey Pinellas County's existing and potential risk to identified hazards; (2) assess how well local hazard mitigation principles have been incorporated into the County's Comprehensive Plan; (3) provide recommendations on how hazard mitigation can better be integrated into the Comprehensive Plan; and (4) determine if any enhancements could be made to the LMS to better support comprehensive planning. Best available statewide level data is provided to convey exposure and risk as well as to illustrate the vulnerability assessment component of the integration process.

Summary of Recommendations

Pinellas County's Comprehensive Plan has good integration of hazard mitigation principles and its LMS has adequate data and goals to support comprehensive planning. There are many goals, objectives, and policies that support risk reduction from hurricanes and floods in the LMS and Comprehensive Plan. However, there are always ways to strengthen such plans, and the following is a summary of options for the County to do so.

Comprehensive Plan Preliminary Recommendations

The following recommendations include hazard mitigation measures in which Pinellas County can continue to reduce or eliminate risks from storm surge, flood, wildfire, and sinkhole. These recommendations pertain to the use of vacant lands and/or redevelopment practices. Based on the land use tabulations, most of the vacant acreage is susceptible to flood and tropical cyclone generated storm surge. For more information about the methodology and data used for the land use tabulations, please refer to Section 2. Hazard Vulnerability in this hazards profile.

Of the vacant lands, 3,002 acres are susceptible to Category 1 storm surge (CHZ), 11,699 acres are susceptible to Category 1 – 3 storm surge (HVZ), 10,243 are susceptible to 100-year flood, 1,691 acres are susceptible to wildfire, and 2,678 acres are susceptible to sinkholes. Susceptibility for surge, flood, and wildfire are based on risk, whereas susceptibility for sinkhole is based on exposure. Therefore, further analysis is needed to determine the level of risk associated with sinkhole hazards. According to the Pinellas County LMS, the County is deemed to have a moderate risk from sinkhole hazards. There is a high probability that sinkholes will develop in sinkhole-prone areas of the County; however, the probability is low that these sinkholes will be large enough to cause extensive damage or causalities. Based on historical and geological information, Pinellas County is vulnerable to sinkhole occurrences, but the population-at-risk is moderate, due to the nature of sinkhole development (Pinellas County LMS 2005).

Storm Surge

Around 71% of the 3,002 vacant acres in the Coastal High Hazard Area and 75% of the 11,699 vacant acres in the Hurricane Vulnerability Zone are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The Comprehensive Plan should continue limiting development in surge prone areas by not allowing density bonuses and incentives for affordable housing in the Coastal High Hazard Area (CHHA); requiring that the level of population density and development intensity in the coastal planning area be compatible with evacuation capabilities through Land Development Regulations; not approving residential density above 5 u/ga for future land use within the CHHA; and prohibiting development in the frontal dune and beach area.
- The Comprehensive Plan should continue prohibiting new or expansions of existing schools, hospitals, nursing homes, assisted living facilities, and mobile home development; limiting county-funded infrastructure; not constructing bridges or causeways to barrier islands not serviced by such infrastructure at the time of Plan adoption; and not siting wastewater treatment facilities in the CHHA.
- The Comprehensive Plan should continue evaluating the feasibility of limiting capacity of hospitals, nursing homes, and assisted living facilities proposed for location in the Evacuation Level B area.
- The County should continue prohibiting new licensed group homes and foster care facilities in hurricane vulnerable areas.
- The County should continue developing an inventory of transportation disadvantaged persons that would be affected by an evacuation order; ensuring the availability of adequate transportation facilities for safe and timely evacuation of high risk areas; increasing the efficiency and effectiveness of mass transit to accommodate the needs of transportation disadvantaged people and reducing the single-occupant vehicle demand; and evaluating projects for inclusion within the Six-Year Schedule of Improvements, per the Capital Improvements Element, placing high priority on improvements for critical links and evacuation route points, and transportation routes designated as regional evacuation routes.
- The Comprehensive Plan should continue requiring recreational vehicle parks and transient accommodations to prepare hurricane evacuation plans; coordinating with the Florida Department of Transportation to encourage the State to give priority to road improvement projects on regional evacuation routes; and expediting evacuations using existing countywide computerized traffic signalization and clear signage.
- The Comprehensive Plan should continue supporting the co-location existing or planned schools and county buildings with emergency shelters or designing these facilities as emergency shelters, and coordinating with the Pinellas County School Board to do so; and promoting alternatives to traditional sheltering through public education such as host home programs, inland sheltering, retrofitting of existing structures, using refuges of last resort (as appropriate), and evacuating guests from transient accommodations to inland “sister” transient accommodations.
- The Comprehensive Plan should continue restoring dunes as part of beach nourishment projects and preserving county owned beach front property.
- The County should continue using the Post Disaster Redevelopment Plan for establishing procedures for evaluating the effectiveness of current hazard mitigation measures in preventing damage; including priorities for acquiring storm-damaged property; and implementing mitigation programs such as land use, zoning, and subdivision regulations.
- The County should consider prohibiting septic tanks for new development in the CHHA.

- The County should consider coordinating with the MPO to prioritize transportation maintenance and improvements for critical evacuation routes.
- The Comprehensive Plan should continue to require that developments in the HVZ evaluate the impact that additional traffic will have on evacuation times and that additional population will have on shelter capacity.
- The Comprehensive Plan should consider not allowing solid waste and commercial hazardous waste management facilities in the HVZ.
- The County should consider denying requests for residential density increases within the CHHA, above what is included on the Future Land Use Map.
- The County should consider retrofitting new schools as shelters outside the HVZ, where possible.
- The County should consider requiring that the deeds for the sale of land or structures in hurricane vulnerable zones contain a hurricane hazard disclosure statement.
- The County should consider using transfer of development rights from areas within the CHHA to areas outside the CHHA,
- The Comprehensive Plan should include a policy to maintain or reduce the hurricane evacuation clearance time published in the FDEM Hurricane Evacuation Study, institute a level of service (LOS) standard that is tied to levels of development or population and/or institute an impact fee in the CHHA or HVZ to help pay for additional road capacity, retrofits required for evacuations, and shelter space.

Flood

About 68% of the 10,243 vacant acres in the 100-year floodplain are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The Comprehensive Plan should continue the implementation of policies for preserving and enhancing the natural environment through a sensitive land use program which includes land development code for floodplain management and flood damage prevention, protecting significant wetlands per existing preservation designations on the Future Land Use Map, encouraging alternatives to hardened structures along natural riverine tributaries, and prohibiting fill or other development activities having significant long-term impacts on the ecological or hydrological function of the floodplain except in cases of clear public interest.
- The Comprehensive Plan should continue applying the Pinellas County Stormwater Management Plan, including a feasibility study to evaluate the benefits of natural drainageways and the retention or restoration of natural storage areas for each stormwater management project design, giving preference to natural versus structural alternatives or a combination of both methods, and preserving floodplains and wetlands and protected conveyance systems as natural storage.
- The Comprehensive Plan should continue requiring that new or expansions of existing school facilities not occur in floodways, and prohibiting licensed group homes and foster care facilities in residential districts in areas where potential for flooding exists.
- The Comprehensive Plan should continue requiring that developers incorporate wetland portions of sites in the 100-year floodplain as conservation easements through the site review process; limiting residential density to 5 u.p.a for areas within the 100-year floodplain, and preserving wetlands and floodplains as conveyance systems through designation on the Future Land Use Map.
- The County should consider retrofitting stormwater management facilities.
- The County should consider encouraging new developments to demonstrate cluster development to achieve open space to protect floodplains.

- The County should consider including a policy for reducing future losses through transfers of development right from areas within the 100-year floodplain to areas outside the 100-year floodplain.
- The County should consider including a policy to not approve variances to required flood elevations.
- The County should consider establishing an impact fee and/or other equitable user-oriented revenue sources for the construction of drainage facilities, either county-wide or in districts of high flooding potential.
- The County should consider the requirement for the installation of back-flow preventers on new septic tanks in the 100-year floodplain to mitigate impacts from flood, or create incentives and disincentives to reduce the desirability of septic installation within the 100-year floodplain.
- The County should consider requiring that all structures built in the 100-year floodplain include at least 1 foot freeboard. Many post-disaster building performance/damage assessments have shown that it is advisable to include freeboard to reduce future flood damages. Okaloosa and Brevard Counties, City of Jacksonville and the Santa Rosa Island Authority are example communities that have adopted freeboard requirements.
- The County should consider promoting the use of vegetated swales, sodding, landscaping, and retention of natural vegetation as components of the drainage system for natural runoff through the use of landscape and subdivision ordinances.
- The County should consider requiring that stormwater management planning and construction of capital improvements coincide with stormwater drainage requirements to adequately address growth and development.
- The County should consider requiring that the maintenance and operation of private stormwater systems is funded by private sources.
- The County should consider requiring areas that have not established base flood elevations to be studied prior to development.
- The County should consider calling for compensating storage calculations in all non coastal flood hazard areas.

Wildfire

About 78% of the 1,691 vacant acres that are susceptible to wildfire are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The County should consider participating in the Firewise Medal Community program to reduce risks within the wildland urban interface.
- Where reasonable, consideration should be made to design structures and sites within the County to minimize potential for loss of life and property (e.g., outdoor sprinkler systems, fire-resistant building materials or treatments, and landscaping and site design practices); review proposals for subdivisions, lot splits, and other developments for fire protection needs during site plan review process; coordinate with fire protection service or agencies to determine guidelines for use and development in wildfire-prone areas.
- The County should consider requirement for all new development to include and implement a wildfire mitigation plan specific to that development, subject to review and approval by the County Fire Rescue Department.
- The County should consider increasing public awareness of prescribed burning and require management plans for conservation easements that address reduction in wildfire fuels.

Sinkhole

About 76% of the 2,678 vacant acres that are susceptible to sinkholes are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The Comprehensive Plan should continue the implementation of policies for reducing risk from sinkholes such as publishing available sinkhole data at County offices, and making information on areas with high sinkhole/subsidence susceptibility available for use in County planning and private land development.
- The County should consider coordinating with the Southwest Florida Water Management District to provide technical expertise to the public with regard to sinkhole risks; requiring that new development demonstrate clustered development to achieve open space to protect aquifer recharge; and prohibiting new stormwater management facilities from discharging untreated stormwater runoff into directly-connected sinkholes or the Floridan Aquifer.
- The County should consider the possibility of requiring sub-surface investigations of soil stability in areas suspected of sinkhole activity, per technical advice provided by the Southwest Florida Water Management District and other geo-technical experts.
- The County should consider the possibility of requiring buffers between proposed development and sinkholes, as deemed appropriate.

General

- The Comprehensive Plan should continue including a policy to incorporate recommendations from existing and future interagency hazard mitigation reports into the Comprehensive Plan, and should consider including these recommendations during the Evaluation and Appraisal Report process as determined feasible and appropriate by the Board of County Commissioners.
- Include each hazard layer on the existing and future land use maps to determine where risks are possible to target hazard mitigation strategies.
- The Comprehensive Plan should consider including a policy to incorporate applicable provisions of the Comprehensive Plan into the Comprehensive Emergency Management Plan and the Local Mitigation Strategy.
- Continue educating the public, especially those at high risk from hurricanes, floods, and wildfires, & make them aware of proactive steps they can take to mitigate damage.

Local Mitigation Strategy Preliminary Recommendations

The following data and information could be included in an update of the LMS. This information could help convey how and where disasters impact the population and the built environment to support comprehensive planning.

- Include data layers on hazard maps to illustrate population (i.e., density) or property (i.e., value) exposure.
- Include a future land use maps that include hazard data layers to illustrate which future land use categories are susceptible to each hazard.
- Include a quantitative risk assessment for future development (i.e., loss estimates) or specific critical facilities.
- Use complementary, not contradictory data in the plans such as the LMS, CEMP, and Comprehensive Plan.

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1. County Overview

Geography and Jurisdictions

Pinellas County is located along the Gulf of Mexico in the western portion of the central Florida peninsula. It covers a total of 607.7 square miles, of which 279.9 square miles are land and 327.8 square miles are water. There are 24 incorporated municipalities within Pinellas County, as shown in **Table 1.1**. The City of Clearwater serves as the county seat.

Population and Demographics

According to the April 1, 2004 population estimate by the University of Florida's Bureau of Economic and Business Research (BEBR), population estimates for all jurisdictions within Pinellas County and the percent change from the 2000 U.S. Census are presented in **Table 1.1**. While some residents live in unincorporated areas, nearly 70% live in incorporated jurisdictions of the county. Pinellas County has experienced moderate population growth in recent years, a trend that is expected to continue. Between 1990 and 2000, Pinellas County had a growth rate of 8.2%, which is nearly two thirds less than the statewide average of 23.5% for the same time period.

Table 1.1 Population Estimates by Jurisdiction

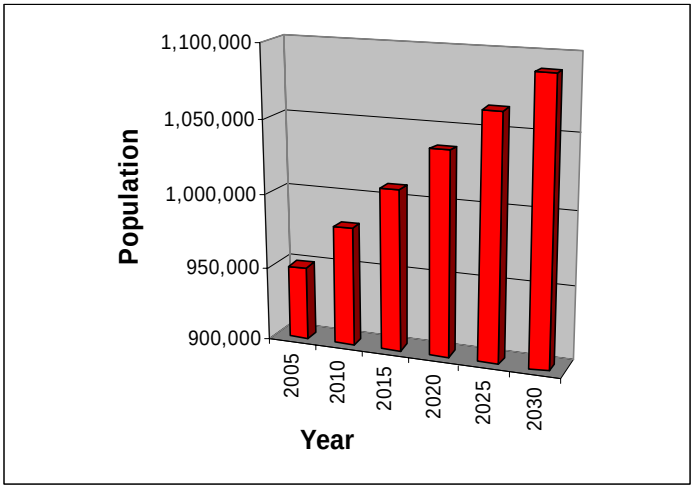
Jurisdiction	Population (Census 2000)	Population (Estimate 2004)	Percent Change 2000-2004	Percent of Total Population (2004)
Unincorporated	287,953	284,306	-1.27%	30.13%
Belleair	4,067	4,107	0.98%	0.44%
Belleair Beach	1,632	1,632	0.00%	0.17%
Belleair Bluffs	2,243	2,240	-0.13%	0.24%
Belleair Shore	75	72	-4.00%	0.01%
Clearwater	108,789	110,325	1.41%	11.69%
Dunedin	35,691	37,217	4.28%	3.94%
Gulfport	12,527	12,860	2.66%	1.36%
Indian Rocks Beach	5,127	5,288	3.14%	0.56%
Indian Shores	1,705	1,796	5.34%	0.19%
Kenneth City	4,400	4,539	3.16%	0.48%
Largo	69,371	72,817	4.97%	7.72%
Madeira Beach	4,511	4,504	-0.16%	0.48%
North Redington Beach	1,474	1,543	4.68%	0.16%
Oldsmar	11,910	13,737	15.34%	1.46%
Pinellas Park	45,658	47,572	4.19%	5.04%
Redington Beach	1,539	1,592	3.44%	0.17%
Redington Shores	2,338	2,341	0.13%	0.25%
Safety Harbor	17,203	17,800	3.47%	1.89%
St. Petersburg	248,232	253,010	1.92%	26.81%
St. Pete Beach	9,929	10,004	0.76%	1.06%
Seminole	10,890	17,799	63.44%	1.89%
South Pasadena	5,778	5,837	1.02%	0.62%
Tarpon Springs	21,003	23,170	10.32%	2.46%

Jurisdiction	Population (Census 2000)	Population (Estimate 2004)	Percent Change 2000-2004	Percent of Total Population (2004)
Treasure Island	7,450	7,532	1.10%	0.80%
Total	**921,495**	**943,640**	**2.40%**	**100.00%**

Source: University of Florida, Bureau of Economic and Business Research, 2004

According to BEBR (2004), Pinellas County's population is projected to grow steadily and reach an estimated 1,089,300 by the year 2030, increasing the average population density of 3,371 to 3,891 persons per square mile. **Figure 1.1** illustrates medium growth population projections for Pinellas County based on 2004 calculations.

Figure 1.1 Population Projections for Pinellas County, 2005–2030



Source: University of Florida, Bureau of Economic and Business Research, 2004

Of particular concern within Pinellas County's population are those persons with special needs or perhaps limited resources such as the elderly, disabled, low-income or language isolated residents. According to the 2000 Census, of the 921,495 persons residing in Pinellas County, 22.5% are listed as 65 years old or over, 23.9% are listed as having a disability, 12% are listed as below poverty, and 10% live in a home where the primary language is other than English.

2. Hazard Vulnerability

Hazards Identification

The highest risk hazards for Pinellas County as identified in the County's Local Mitigation Strategy (LMS) are hurricanes and tropical storms, erosion, tornadoes, and flooding (coastal and rainfall). Wildfire and sinkholes were discussed in the LMS, but the risk for both hazards was considered to be moderate to low for the entire county.

Hazards Analysis

The following analysis examines four hazard types: surge from tropical cyclones, flood, wildfire and sinkholes. All of the information in this section was obtained through the online Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS). MEMPHIS was designed to provide a variety of hazard related data in support of the Florida Local Mitigation Strategy DMA 2K project, and was created by Kinetic Analysis Corporation (KAC) under contract with the Florida Department of Community Affairs (DCA). Estimated exposure values were determined using the Category 3 Maxima Scenario for storm surge; FEMA's designated 100-year flood zones (i.e., A, AE, V, VE, AO, 100 IC, IN, AH) for flood; all medium-to-high risk zones from MEMPHIS for wildfire (Level 5 through Level 9); and the combined high, very high, extreme and

adjacent zones for sinkhole based on the KAC analysis. Storm surge exposure data is a subset of flood exposure; therefore, the storm surge results are also included in the flood results. For more details on a particular hazard or an explanation of the MEMPHIS methodology, consult the MEMPHIS Web site (http://lmsmaps.methaz.org/lmsmaps/index.html).

Existing Population Exposure

Table 2.1 presents the population currently exposed to each hazard in Pinellas County. Of the 921,495 (U.S. Census 2000) people that reside in Pinellas County, 16.5% are exposed to storm surge, 28.4% are exposed to 100-year flooding, 28.1% are exposed to wildfire, and 13.2% are exposed to sinkholes. Of the 261,778 people exposed to flood, 34.8% are disabled and 24.1% are over age 65.

Table 2.1 Estimated Number of Persons Exposed to Selected Hazards

Segment of Population	Storm Surge**	Flood	Wildfire	Sinkhole
Total (all persons)*	**152,050**	**261,778**	**259,022**	**121,212**
Minority	11,919	22,850	38,154	15,111
Over 65	43,337	63,055	57,039	25,696
Disabled	54,045	91,091	102,004	48,596
Poverty	11,145	19,042	25,298	10,935
Language-Isolated	3,280	2,796	2,637	1,007
Single Parent	6,688	13,069	15,937	7,714

Source: Mapping for Emergency Management, Parallel Hazard Information System

*Note: The "Total" amount does not equal the sum of all segments of the population, but indicates the total population at risk to the selected hazards.
**Note: Storm surge related flooding population exposure results are a subset of the flood results.

Evacuation and Shelters

As discussed in the previous sections, population growth in Pinellas County has been steady, and the trend is projected to continue. Additionally, storm events requiring evacuation typically impact large areas, often forcing multiple counties to issue evacuation orders simultaneously and placing a greater cumulative number of evacuees on the roadways which may slow evacuation time further. Thus, it is important to not only consider evacuation times for Pinellas County, but also for other counties in the region as shown in **Table 2.2**. Also, population that will reside in new housing stock might not be required to evacuate as new construction will be built to higher codes and standards.

Table 2.2 County Clearance Times per Hurricane Category (Hours)

(High Tourist Occupancy, Medium Response)

County	Category 1 Hurricane	Category 2 Hurricane	Category 3 Hurricane	Category 4 Hurricane	Category 5 Hurricane
Hernando	8	8	10.5	16	16
Hillsborough	17	17.5	19	21.5	21.5
Manatee	11	16	16.5	19	19
Pasco	9	10.5	14.5	19.5	19.5
Pinellas	17	17.5	19	21.5	21.5

Source: DCA, DEM Hurricane Evacuation Study Database, 2005

As the population increases in the future, the demand for shelter space and the length of time to evacuate will increase, unless measures are taken now. Currently, it is expected to take between 17 and 21.5 hours to safely evacuate Pinellas County depending on the corresponding magnitude

of the storm, as shown in **Table 2.2**. This data was derived from eleven regional Hurricane Evacuation Studies that have been produced by FEMA, the United States Army Corps of Engineers and Regional Planning Councils in Florida. The study dates range from 1995 to 2004. These regional studies are updated on a rotating basis.

Similar to most of Florida's coastal counties, Pinellas County currently has a significant shelter deficit. According to Florida's Statewide Emergency Shelter Plan, Pinellas County has an existing shelter capacity of 35,526 people. The 2004 shelter demand for a Category 4 or Category 5 hurricane is 129,053 people, leaving an existing shelter deficit of 93,527. In 2009, the projected shelter demand is 134,135, leaving an anticipated shelter deficit of 98,609.

Per an objective in the Coastal Element (9J-5.012(3)(b)7.), counties must maintain or reduce hurricane evacuation times. This could be accomplished by using better topographical data to determine the surge risk to populations to evaluate which areas to evacuate, and increasing the ability to shelter in place to decrease the number of evacuees. Pinellas County could encourage new homes to be built with saferooms, community centers in mobile home parks or developments to be built to shelter standards (outside of the hurricane vulnerability zones), or require that new schools be built or existing schools be retrofitted to shelter standards; which would be based on FEMA saferoom and American Red Cross shelter standards. Additionally, the county could establish level of service (LOS) standards that are tied to development.

Existing Built Environment Exposure

While the concern for human life is always highest in preparing for a natural disaster, there are also substantial economic impacts to local communities, regions, and even the state when property damages are incurred. To be truly sustainable in the face of natural hazards, we must work to protect the residents and also to limit, as much as possible, property losses that slow down a community's ability to bounce back from a disaster. **Table 2.3** presents estimates of the number of structures in Pinellas County by occupancy type that are exposed to each of the hazards being analyzed. Exposure refers to the number of people or structures that are susceptible to loss of life, property damage and economic impact due to a particular hazard. The estimated exposure of Pinellas County's existing structures to the storm surge, flood, wildfire, and sinkhole hazards was determined through MEMPHIS.

Table 2.3 Estimated Number of Structures Exposed to Selected Hazards

Occupancy Type	Storm Surge	Flood	Wildfire	Sinkhole
Single Family	42,189	117,881	61,557	31,056
Mobile Home	1,695	106,646	10,269	1,859
Multi-Family	42,485	63,044	23,921	8,723
Commercial	2,900	18,089	3,358	1,436
Agriculture	22	2,176	1,114	462
Gov. / Institutional	639	424	55	16
Total	**89,930**	**308,260**	**100,274**	**43,552**

Source: Mapping for Emergency Management, Parallel Hazard Information System

*Note: Storm surge related flooding building exposure results are a subset of the flood results.

There are 452,086 structures exposed to at least one of the four hazards, of which most are single-family homes in subdivisions. Of these structures, 68.2% are exposed to flood. Over 308,000 structures are located within the 100-year floodplain, of which 29.2% are exposed to storm surge induced flooding. Nearly 47% of the structures exposed to surge are single-family homes, and 47.2% are multi-family homes. Typically, structures exposed to surge are high-value real estate due to their proximity to the ocean or tidally influenced water bodies, such as the Gulf of Mexico and the Tampa Bay. According to the latest National Flood Insurance Program Repetitive Loss Properties list, as of March 2005, there are 119 repetitive loss properties in

unincorporated areas of Pinellas County. Under the National Flood Insurance Program (NFIP), repetitive loss properties are defined as "any NFIP-insured property that, since 1978 and regardless of any change(s) of ownership during that period, has experienced: a) four or more paid flood losses; or b) two paid flood losses within a 10-year period that equal or exceed the current value of the insured property; or c) three or more paid losses that equal or exceed the current value of the insured property."

Slightly over 22%, or 100,274 structures are exposed to wildfire, of which 61.4% are single-family homes. The highest risk areas are primarily found in the wildland/urban interface developments located at various sites around the county (Pinellas County LMS, 2004). There are 9.6% or 43,552 structures are located within sinkholes susceptible areas, of which 71.3% are single-family homes.

In addition to understanding exposure, risk assessment results must also be considered for prioritizing and implementing hazard mitigation measures. The risk assessment takes into account the probability (how often) and severity (e.g., flood depth, storm surge velocity, wildfire duration) of the hazard as it impacts people and property. Risk can be described qualitatively, using terms like high, medium or low; or quantitatively by estimating the losses to be expected from a specific hazard event expressed in dollars of future expected losses. Although people and property are exposed to hazards, losses can be greatly reduced through building practices, land use, and structural hazard mitigation measures. The next section of this report examines the existing and future land use acreage in hazard areas. This information can be useful to consider where to implement risk reducing comprehensive planning measures.

Analysis of Current and Future Vulnerability Based on Land Use

The previous hazards analysis section discussed population and existing structures exposed to surge, flood, sinkholes, and wildfire according to MEMPHIS estimates. This section is used to demonstrate the County's vulnerabilities to these hazards in both tabular format and spatially, in relation to existing and future land uses. DCA tabulated the total amount of acres and percentage of land in identified hazard exposure areas, sorted by existing land use category for the unincorporated areas. Existing land use data was acquired from County Property Appraisers and the Florida Department of Revenue in 2004. DCA also tabulated the total amount of acres and percentage of land in the identified hazards areas sorted by their future land use category according to the local Future Land Use Map (FLUM), as well as the amount of these lands listed as vacant according to existing land use. Pinellas County future land use data (which uses generalized future land use classification system on Pinellas County countywide FLUM created by the Pinellas Planning Council) was acquired in September 2002 and might not reflect changes per recent future land use amendments. DCA has provided maps of existing land use within hazard areas based on the 2004 County Property Appraiser geographic information system (GIS) shapefiles. Maps of future land uses in hazard areas were developed using the Pinellas County future land use map dated September 2002. A series of maps were created as part of the analysis and are available as attachments to the county profile. All maps are for general planning purposes only.

For the purposes of this profile, the identified hazard areas include the coastal hazards zone in relation to storm surge, hurricane vulnerability zones in relation to evacuation clearance times, flood zones in relation to the 100-year flood, wildfire susceptible areas, and sinkhole susceptible areas.

In **Attachment A**, two maps present the existing and future land uses within the Coastal Hazards Zone (CHZ), which represents the Category 1 Hurricane Evacuation Zone joined with the Category 1 Storm Surge Zone, to fully demonstrate all areas that are prone to storm surge. The areas that are most susceptible to storm surge are located in the coastal communities along the Gulf of Mexico and along Tampa Bay. The total amount of land in the CHZ is 10,692.6 acres. As shown in **Table 2.4**, 28.1% are currently undeveloped; 25.5% are parks, conservation areas and golf courses; 9.3% are used for government, institutional, hospitals or education purposes; and

9.1% are used for residential single-family homes. **Table 2.5** shows that of the 3,002.4 undeveloped acres, 26.9% are designated for preservation. The County has taken favorable action in designating a portion of vacant acreage in the 100-year flood zone for preservation.

In **Attachment B**, two maps present the existing and future land uses within the Hurricane Vulnerability Zone (HVZ), which represents Category 1 to 3 Hurricane Evacuation Zones. The HVZ is predominantly located in the coastal communities along the Gulf of Mexico as well as St. Petersburg, but are also found in the central portion of the county. The total amount of land in the HVZ is 54,513.8 acres. As shown in **Table 2.4**, 24% are used for residential single-family homes; 21.5% are currently undeveloped; 17.3% are parks, conservation areas and golf courses; and 14.2% are used for government, institutional, hospitals or education purposes. **Table 2.5** shows that of the 11,698.7 undeveloped acres, 13% are designated for preservation. The County has taken favorable action in designating a portion of vacant acreage in the 100-year flood zone for preservation.

In **Attachment C**, two maps present the existing and future land uses within a 100-year flood zone. There are flood-prone areas scattered across the County. However, a majority of the large swaths are located along the Gulf of Mexico coastline and coastal areas of St. Petersburg. The total amount of land in the special flood hazard area is 53,211.8 acres. As shown in **Table 2.4**, 25.6% are used for residential single-family homes; 22.5% are parks, conservation areas and golf courses; 19.3% are currently undeveloped; and 14.4% are used for government, institutional, hospitals or education purposes. **Table 2.5** shows that of the 10,243.4 undeveloped acres, 17.2% are designated for preservation. The County has taken favorable action in designating a portion of vacant acreage in the 100-year flood zone for preservation.

In **Attachment D**, two maps present the existing and future land uses within wildfire susceptible areas. These small areas are scattered across the northern portion of the County. The total amount of land in the wildfire susceptible areas is 9,056.2 acres. As shown in **Table 2.4**, 30% are used for residential single-family homes; 19.3% are parks, conservation areas and golf courses; 18.7% are currently undeveloped; and 17.2% are used for government, institutional, hospitals or education purposes. **Table 2.5** shows that of the 1,691.4 undeveloped acres, 19.6% are designated for low density residential development. The County should continue to take measures to reduce wildfire risk within the urban/rural interface.

In **Attachment E**, two maps present the existing and future land uses within sinkhole susceptible areas. These areas are scattered across the County. The total amount of land in the sinkhole susceptible areas is 16,299 acres. As shown in **Table 2.4**, 40.4% are used for residential single-family homes; 12.2% are used for government, institutional, hospitals or education purposes; and 6.8% are used for commercial purposes. **Table 2.5** shows that of the 2,678.3 undeveloped acres, 15.4% are designated for urban residential use. The County might want to conduct additional research to determine the level of risk associated with developing this acreage for urban residential use, so that mitigation measures can be implemented if warranted.

Table 2.4 Total Unincorporated Acres in Hazard Areas by Existing Land Use Category

Existing Land Use Category		Coastal Hazard Zone	Hurricane Vulnerability Zone	Flood Zones	Wildfire Susceptible Areas	Sinkhole Susceptible Areas
Agriculture	Acres	58.2	147.4	345.5	193.3	12.9
	%	0.5	0.3	0.6	2.1	0.1
Attractions, Stadiums, Lodging	Acres	297.6	393.9	429.1	20.7	62.6
	%	2.8	0.7	0.8	0.2	0.4
Places of Worship	Acres	51.9	553.1	428.7	78.7	345.3
	%	0.5	1.0	0.8	0.9	2.1
Commercial	Acres	552.2	2,405.0	1,724.8	115.7	1,101.3
	%	5.2	4.4	3.2	1.3	6.8
Government, Institutional, Hospitals, Education	Acres	990.3	7,725.4	7,650.7	1,560.3	1,983.6
	%	9.3	14.2	14.4	17.2	12.2
Industrial	Acres	143.3	2,275.9	1,280.3	84.5	429.1
	%	1.3	4.2	2.4	0.9	2.6
Parks, Conservation Areas, Golf Courses	Acres	2,723.8	9,448.0	11,974.7	1,746.0	976.9
	%	25.5	17.3	22.5	19.3	6.0
Residential Group Quarters, Nursing Homes	Acres	65.3	445.2	278.7	82.0	141.8
	%	0.6	0.8	0.5	0.9	0.9
Residential Multi-Family	Acres	842.2	2,909.0	2,514.4	389.0	1,096.8
	%	7.9	5.3	4.7	4.3	6.7
Residential Mobile Home, or Commercial Parking Lot	Acres	174.3	1,284.7	808.8	29.4	515.9
	%	1.6	2.4	1.5	0.3	3.2
Residential Single-Family	Acres	975.5	13,106.3	13,617.0	2,712.8	6,590.5
	%	9.1	24.0	25.6	30.0	40.4
Submerged Land (Water Bodies)	Acres	61.5	285.8	391.7	10.9	19.6
	%	0.6	0.5	0.7	0.1	0.1
Transportation, Communication, Rights-Of-Way	Acres	82.9	206.0	237.0	13.6	39.0
	%	0.8	0.4	0.4	0.2	0.2
Utility Plants and Lines, Solid Waste Disposal	Acres	671.2	1,629.4	1,287.0	327.9	305.4
	%	6.3	3.0	2.4	3.6	1.9
Vacant	Acres	3,002.4	11,698.7	10,243.4	1,691.4	2,678.3
	%	28.1	21.5	19.3	18.7	16.4
Total Acres	**Acres**	**10,692.6**	**54,513.8**	**53,211.8**	**9,056.2**	**16,299.0**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Department of Community Affairs

Table 2.5 Total Unincorporated Acres in Hazard Areas by Future Land Use Category

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas		Sinkhole Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant
Central Business District	Acres	35.9	8.0	86.3	25.2	78.5	19.6	0.0	0.0	88.3	12.5
	%	0.3	0.3	0.2	0.2	0.1	0.2	0.0	0.0	0.5	0.5
Commercial General	Acres	842.2	215.6	2,038.7	436.5	1,576.1	336.8	87.8	47.5	765.3	108.6
	%	7.9	7.2	3.7	3.7	3.0	3.3	1.0	2.8	4.7	4.1
Commercial Limited	Acres	15.6	5.6	43.7	13.6	20.5	7.8	0.2	0.2	51.3	7.1
	%	0.1	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.3	0.3
Commercial Neighborhood	Acres	19.2	2.5	31.4	7.6	29.2	6.0	0.9	0.0	12.7	5.1
	%	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2
Commercial Recreation	Acres	118.8	33.0	171.2	36.1	150.0	39.9	44.8	6.9	17.2	3.3
	%	1.1	1.1	0.3	0.3	0.3	0.4	0.5	0.4	0.1	0.1
Community Redevelopment District	Acres	232.7	57.1	362.7	85.2	479.5	116.4	25.9	1.6	228.5	50.2
	%	2.2	1.9	0.7	0.7	0.9	1.1	0.3	0.1	1.4	1.9
Industrial	Acres	0.0	0.0	1,902.7	177.7	1,509.5	125.1	471.1	37.2	1,031.3	76.5
	%	0.0	0.0	3.5	1.5	2.8	1.2	5.2	2.2	6.3	2.9
Industrial General	Acres	40.4	23.2	670.4	228.9	321.0	92.3	87.8	40.8	177.5	40.8
	%	0.4	0.8	1.2	2.0	0.6	0.9	1.0	2.4	1.1	1.5
Industrial Light	Acres	205.8	83.6	4,419.6	1,423.4	2,697.2	881.9	473.1	229.2	734.8	206.4
	%	1.9	2.8	8.1	12.2	5.1	8.6	5.2	13.6	4.5	7.7
Preservation	Acres	4,243.9	806.6	8,432.3	1,519.3	8,598.9	1,763.6	439.2	102.1	956.4	220.0
	%	39.7	26.9	15.5	13.0	16.2	17.2	4.8	6.0	5.9	8.2
Preservation-Resource Management	Acres	119.5	0.0	236.8	4.0	2,120.7	2.5	436.7	4.5	0.0	0.0
	%	1.1	0.0	0.4	0.0	4.0	0.0	4.8	0.3	0.0	0.0
Public/Semi-Public	Acres	2.9	2.7	3.6	0.2	3.8	3.6	0.0	0.0	5.3	4.0
	%	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Recreation/ Open Space	Acres	0.0	0.0	7,253.0	847.4	6,962.1	761.1	1,770.5	171.2	1,171.1	220.3
	%	0.0	0.0	13.3	7.2	13.1	7.4	19.5	10.1	7.2	8.2
Residential Estate	Acres	239.0	41.9	0.0	0.0	475.1	69.6	161.8	25.0	123.9	30.1
	%	2.2	1.4	0.0	0.0	0.9	0.7	1.8	1.5	0.8	1.1
Residential High	Acres	339.1	252.6	406.8	266.4	475.1	331.3	24.3	7.1	80.9	51.3
	%	3.2	8.4	0.7	2.3	0.9	3.2	0.3	0.4	0.5	1.9
Residential Low	Acres	0.0	0.0	6,578.2	1,510.8	5,201.6	1,095.7	1,475.1	332.2	3,033.0	356.9
	%	0.0	0.0	12.1	12.9	9.8	10.7	16.3	19.6	18.6	13.3
Residential Low Medium	Acres	605.9	216.5	1,528.4	593.0	1,184.7	449.2	142.5	51.3	645.6	200.9
	%	5.7	7.2	2.8	5.1	2.2	4.4	1.6	3.0	4.0	7.5
Residential Medium	Acres	1,544.9	789.8	3,094.3	1,322.6	2,733.3	1,346.5	237.0	93.9	979.3	266.4
	%	14.4	26.3	5.7	11.3	5.1	13.1	2.6	5.6	6.0	9.9
Residential Rural	Acres	449.2	104.6	874.6	257.7	1,285.4	259.7	1,008.5	186.8	6.7	0.7
	%	4.2	3.5	1.6	2.2	2.4	2.5	11.1	11.0	0.0	0.0
Residential Suburban	Acres	318.8	65.8	2,009.3	431.8	1,237.5	254.6	719.6	86.3	457.9	76.5
	%	3.0	2.2	3.7	3.7	2.3	2.5	7.9	5.1	2.8	2.9

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas		Sinkhole Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant
Residential Urban	Acres	0.0	0.0	8,786.3	1,333.3	9,302.4	958.8	627.8	117.3	4,284.9	411.5
	%	0.0	0.0	16.1	11.4	17.5	9.4	6.9	6.9	26.3	15.4
Residential/ Office General	Acres	269.7	88.7	1,103.1	315.9	958.8	267.5	134.0	53.9	216.5	48.8
	%	2.5	3.0	2.0	2.7	1.8	2.6	1.5	3.2	1.3	1.8
Residential/ Office Limited	Acres	0.0	0.0	9.8	1.3	5.8	5.8	2.9	2.2	13.4	7.8
	%	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.3
Residential/Office/ Retail	Acres	0.0	0.0	489.8	124.2	428.0	97.0	27.4	7.6	353.3	65.3
	%	0.0	0.0	0.9	1.1	0.8	0.9	0.3	0.4	2.2	2.4
Resort Facilities High	Acres	128.0	49.7	109.5	46.8	159.2	56.4	0.0	0.0	0.0	0.0
	%	1.2	1.7	0.2	0.4	0.3	0.6	0.0	0.0	0.0	0.0
Resort Facilities Medium	Acres	269.1	122.8	220.9	103.0	313.9	153.6	0.0	0.0	0.0	0.0
	%	2.5	4.1	0.4	0.9	0.6	1.5	0.0	0.0	0.0	0.0
Resort Facilities Overlay - Temporary	Acres	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road	Acres	7.1	1.1	16.1	4.2	13.8	8.0	2.0	2.0	2.5	2.5
	%	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1
Transportation/ Utilities	Acres	642.0	31.2	2,542.5	208.4	1,948.4	137.1	577.2	68.2	529.5	118.2
	%	6.0	1.0	4.7	1.8	3.7	1.3	6.4	4.0	3.2	4.4
Unknown	Acres	0.2	0.0	0.9	0.7	0.9	0.0	0.0	0.0	0.9	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water	Acres	0.0	0.0	1,046.0	366.5	2,900.1	589.6	74.2	12.7	329.5	86.7
	%	0.0	0.0	1.9	3.1	5.5	5.8	0.8	0.8	2.0	3.2
Water/ Drainage Feature	Acres	2.9	0.0	44.8	6.9	40.8	6.5	4.0	3.8	1.8	0.0
	%	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.0	0.0
Total Acres	**Acres**	**10,692.8**	**3,002.4**	**54,513.7**	**11,698.7**	**53,211.8**	**10,243.4**	**9,056.3**	**1,691.4**	**16,299.1**	**2,678.3**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Department of Community Affairs

The amount of total land and existing vacant land in identified hazard areas was also tabulated for each of Pinellas County's 24 incorporated municipalities. These amounts are listed in **Table 2.6.** The intent of this table is to show the vacant acreage in hazard zones in each municipality, and to show the percentage of vacant acreage in each hazard zone for each municipality. In the total column for each hazard, the percentage for each municipality is the hazard zone acreage as a percent of total hazard acreage for all municipalities. In the vacant column for each hazard, the percentage for each municipality is the percent of area in the hazard zone for the respective municipality. The total municipal percent of vacant acreage is the percent of acreage in the hazard zones for all municipalities.

The City of St. Petersburg has the most vacant acres in the Coastal Hazards Zone, but Indian Shores has the largest proportion of surge prone acres out of its vacant land area. The City of St. Petersburg has the most acres in the HVZ, but Indian Shores has the largest proportion of HVZ acres out of its vacant land area. The City of St. Petersburg has the most acres in the flood zone, but Indian Shores has the largest proportion of flood zone acres out of its vacant land area. The City of St. Petersburg has the most acres in the wildfire susceptible areas, but Redington Shores has the largest proportion of wildfire susceptible acres out of its vacant land area. The City of

Tarpon Springs has the most acres in sinkhole susceptible areas, as well as the largest proportion of sinkhole susceptible acres out of its vacant land area.

Vacant land is often destined to be developed. It is prudent to conduct further analyses of what the vacant lands will be used for, to determine whether they will be populated, and at what level of intensity/density, to ensure that hazard risks are minimized or eliminated. Each of the municipalities in Pinellas County has vacant lands that are in hazard areas. Since hazards cross jurisdictional boundaries, it is important to consider all hazard areas to collaboratively formulate hazard mitigation strategies and policies throughout the county.

Table 2.6 Total Land and Existing Vacant Land in Hazard Areas by Municipal Jurisdiction

Jurisdiction		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas		Sinkhole Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant
Belleair	Acres	47.9	10.7	149.4	54.2	324.4	103.0	0.4	0.0	0.0	0.0
	%	100.0	22.3	100.0	36.3	100.0	31.8	100.0	0.0	0.0	0.0
Belleair Beach	Acres	215.1	38.1	207.8	34.8	473.3	156.3	0.0	0.0	0.0	0.0
	%	100.0	17.7	100.0	16.7	100.0	33.0	0.0	0.0	0.0	0.0
Belleair Bluffs	Acres	24.7	5.3	39.5	8.7	24.3	2.2	0.0	0.0	0.0	0.0
	%	100.0	21.6	100.0	22.0	100.0	9.2	0.0	0.0	0.0	0.0
Belleair Shore	Acres	18.9	2.2	18.9	2.2	24.1	3.8	0.0	0.0	0.0	0.0
	%	100.0	11.8	100.0	11.8	100.0	15.7	0.0	0.0	0.0	0.0
Clearwater	Acres	1,167.7	329.0	1,937.9	481.1	3,157.1	881.2	1,128.9	137.1	1,146.1	117.7
	%	100.0	28.2	100.0	24.8	100.0	27.9	100.0	12.1	100.0	10.3
Dunedin	Acres	1,403.3	107.2	2,127.4	173.2	7,115.5	373.6	55.1	4.5	1,597.3	220.3
	%	100.0	7.6	100.0	8.1	100.0	5.3	100.0	8.1	100.0	13.8
Gulfport	Acres	388.8	145.1	567.6	178.8	818.2	341.5	0.0	0.0	0.0	0.0
	%	100.0	37.3	100.0	31.5	100.0	41.7	0.0	0.0	0.0	0.0
Indian Rocks Beach	Acres	346.0	80.3	345.8	80.3	453.0	124.2	1.6	0.4	0.0	0.0
	%	100.0	23.2	100.0	23.2	100.0	27.4	100.0	28.6	0.0	0.0
Indian Shores	Acres	152.0	74.0	151.4	73.3	272.6	183.2	7.1	4.9	0.0	0.0
	%	100.0	48.7	100.0	48.5	100.0	67.2	100.0	68.7	0.0	0.0
Kenneth City	Acres	0.0	0.0	0.0	0.0	144.9	16.1	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	100.0	11.1	0.0	0.0	0.0	0.0
Largo	Acres	99.9	11.8	1,966.0	317.2	1,046.0	159.2	454.6	122.8	732.8	102.8
	%	100.0	11.8	100.0	16.1	100.0	15.2	100.0	27.0	100.0	14.0
Madeira Beach	Acres	378.3	66.7	379.6	67.1	495.4	87.2	0.0	0.0	0.0	0.0
	%	100.0	17.6	100.0	17.7	100.0	17.6	0.0	0.0	0.0	0.0
North Redington Beach	Acres	97.0	29.2	96.1	29.2	132.9	39.0	0.2	0.0	0.0	0.0
	%	100.0	30.1	100.0	30.4	100.0	29.4	100.0	0.0	0.0	0.0
Oldsmar	Acres	589.6	87.4	4,646.1	1,065.6	1,594.2	313.2	320.1	61.3	39.9	5.1
	%	100.0	14.8	100.0	22.9	100.0	19.6	100.0	19.2	100.0	12.8
Pinellas Park	Acres	51.5	19.8	4,538.4	1,146.3	1,768.7	409.3	374.3	167.0	591.2	54.4
	%	100.0	38.5	100.0	25.3	100.0	23.1	100.0	44.6	100.0	9.2
Redington Beach	Acres	131.3	11.8	131.3	11.8	183.7	19.2	0.0	0.0	0.0	0.0
	%	100.0	9.0	100.0	9.0	100.0	10.4	0.0	0.0	0.0	0.0

Jurisdiction		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas		Sinkhole Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant
Redington Shores	Acres	132.9	27.0	132.9	27.0	167.0	36.6	0.4	0.2	0.0	0.0
	%	100.0	20.3	100.0	20.3	100.0	21.9	100.0	50.0	0.0	0.0
Safety Harbor	Acres	153.2	37.0	585.4	134.4	481.8	148.7	399.7	51.9	509.4	86.9
	%	100.0	24.2	100.0	23.0	100.0	30.9	100.0	13.0	100.0	17.1
Seminole	Acres	128.9	55.1	363.6	136.4	420.7	157.2	12.9	0.0	226.9	5.3
	%	100.0	42.7	100.0	37.5	100.0	37.4	100.0	0.0	100.0	2.4
South Pasadena	Acres	299.8	115.9	310.8	116.6	607.3	214.9	0.0	0.0	0.0	0.0
	%	100.0	38.7	100.0	37.5	100.0	35.4	0.0	0.0	0.0	0.0
St. Pete Beach	Acres	883.9	173.2	882.8	172.3	1,153.0	260.6	0.0	0.0	0.0	0.0
	%	100.0	19.6	100.0	19.5	100.0	22.6	0.0	0.0	0.0	0.0
St. Petersburg	Acres	6,825.2	1,167.5	14,470.4	2,422.4	15,105.7	2,727.5	500.7	172.5	2,431.3	223.2
	%	100.0	17.1	100.0	16.7	100.0	18.1	100.0	34.5	100.0	9.2
Tarpon Springs	Acres	1,954.4	737.0	3,663.4	1,155.9	3,075.8	1,166.4	54.6	13.6	1,978.3	504.5
	%	100.0	37.7	100.0	31.6	100.0	37.9	100.0	24.9	100.0	25.5
Treasure Island	Acres	583.9	132.0	575.4	132.0	758.2	169.4	0.0	0.0	0.0	0.0
	%	100.0	22.6	100.0	22.9	100.0	22.3	0.0	0.0	0.0	0.0
Total Acres	**Acres**	**16,074.4**	**3,463.4**	**38,287.8**	**8,020.8**	**39,797.5**	**8,093.5**	**3,310.7**	**736.3**	**9,253.2**	**1,320.2**
	%	**100.0**	**21.5**	**100.0**	**20.9**	**100.0**	**20.3**	**100.0**	**22.2**	**100.0**	**14.3**

Source: Department of Community Affairs

3. Existing Mitigation Measures

Local Mitigation Strategy (LMS) Assessment

The Local Mitigation Strategy is suited to be a repository for all hazard mitigation analyses (i.e., vulnerability and risk assessment), programs, policies and projects for the county and municipalities. The LMS identifies hazard mitigation needs in a community and alternative structural and nonstructural initiatives that can be employed to reduce community vulnerability to natural hazards. The LMS is multi-jurisdictional and intergovernmental in nature. Communities can reduce their vulnerability to natural hazards by integrating the LMS analyses and mitigation priorities into the local government comprehensive plan.

As noted in DCA's *Protecting Florida's Communities* Guide, one significant strategy for reducing community vulnerability is to manage the development and redevelopment of land exposed to natural hazards. Where vacant land is exposed to hazard forces, local government decisions about allowable land uses, and the provision of public facilities and infrastructure to support those uses, can have major impacts on the extent to which the community makes itself vulnerable to natural hazards. Where communities are already established and land is predominately "built out," local governments can take initiatives to reduce existing levels of vulnerability by altering current land uses both in the aftermath of disasters, when opportunities for redevelopment may arise, and under "blue sky" conditions as part of planned redevelopment initiatives.

Per the *DCA's Protecting Florida's Communities* Guide, LMSes prepared pursuant to the state's guidelines (Florida Department of Community Affairs, 1998) have three substantive components:

> Hazard Identification and Vulnerability Assessment. This section identifies a community's vulnerability to natural hazards. Under Florida rules, the HIVA is required to include, at a

minimum, an evaluation of the vulnerability of structures, infrastructure, special risk populations, environmental resources, and the economy to any hazard to which the community is susceptible. According to FEMA, LMSes revised pursuant to the Disaster Mitigation Act of 2000 (DMA 2000) criteria must include maps and descriptions of the areas that would be affected by each hazard to which the jurisdiction is exposed, information on previous events, and estimates of future probabilities. Vulnerability should be assessed for the types and numbers of exposed buildings, infrastructure, and critical facilities with estimates of potential dollar losses. Plan updates will be required to assess the vulnerability of future growth and development.

Guiding Principles. This section lists and assesses the community's existing hazard mitigation policies and programs and their impacts on community vulnerability. This section typically contains a list of existing policies from the community's Comprehensive Plan and local ordinances that govern or are related to hazard mitigation. Coastal counties frequently include policies from their PDRPs.

Mitigation Initiatives. This component identifies and prioritizes structural and non-structural initiatives that can reduce hazards vulnerability. Proposals for amendments to Comprehensive Plans, land development regulations, and building codes are often included. Structural projects typically address public facilities and infrastructure, and buy-outs of private structures that are repetitively damaged by flood. Many of these qualify as capital improvement projects based on the magnitude of their costs and may also be included in the capital improvements elements of the counties' and cities' Comprehensive Plans.

The Pinellas County LMS (adopted in 2005) was assessed to determine if the hazard analysis and vulnerability assessment (i.e., surge, flood, wildfire, and sinkhole) data can support comprehensive planning, whether the guiding principles include a comprehensive list of policies for the county and municipalities, and whether the LMS goals and objectives support comprehensive planning goals, objectives, and policies (GOP).

Hazard Analysis and Vulnerability Assessment (Appendix 1)

The strengths and weaknesses of the Hazard Analysis and Vulnerability Assessment are as follows:

Strengths:

- Provides information about demographic, income, and special needs population.
- Provides population and property exposure to hazards.
- Provides a hazards analysis and a qualitative vulnerability assessment.
- Provides a clear description of geographic areas exposed to each of the hazards.
- Includes maps for each of the hazards.
- Includes a qualitative risk assessment for each hazard (Hazards Vulnerability Analysis Matrix).
- Includes a quantitative risk assessment (i.e. loss estimates) for each hazard.
- Includes a future land use map.

Weaknesses:

- Hazard maps do not include data layers to illustrate population (i.e., density) or property (i.e., value) exposure.
- Does not include a future land use maps that include hazard data layers to illustrate which future land use categories are susceptible to each hazard.
- Does not include a quantitative risk assessment for future development (i.e., loss estimates) or specific critical facilities.

Incorporating land use and population data into the risk assessment of the LMS provides a better source of data for planners to use in policy making and policy evaluation of the local

comprehensive plan. The LMS also sets a standard for the quality of data that should be used in determining risk and thereby used to determine mitigation policies.

Guiding Principles

The Pinellas County LMS contains a Policies and Ordinances section which includes a list of policies for the county and each municipality which serve as guiding principles. **Table 1.1** in the Pinellas County LMS includes a list of pertinent policies and ordinances with an evaluation of each. A Guiding Principles section is found in most counties' LMSes and is useful in providing the different jurisdictions ideas for enhancing their own plans or providing the LMS committee an analysis of where there may be weaknesses in implementing mitigation strategies.

LMS Goals and Objectives

The Pinellas County LMS has goals and objectives that support mitigation principles that are found in the comprehensive plan. A list of the LMS goals and objectives pertaining to comprehensive planning can be found in **Attachment F**. The following is a summary of the LMS goals and objectives that support comprehensive plan GOPs.

Goal one focuses on public education by increasing public awareness regarding mitigation. Supporting objectives seek to provide education and information to property and business owners about storm damage and ways to properly protect structures; raise the awareness of the need for mitigation and develop ways to better educate the public and elected officials; and to provide an ongoing mitigation educational campaign.

The second goal addresses physical property and infrastructure issues by aiming to create a disaster resistant community. This goal is supported by several objectives, including: the reduction of repetitive loss properties; to review and improve existing land development regulations; to protect existing public facilities and infrastructure and construct new public facilities and infrastructure to be disaster resistant; to enhance building codes to reduce structural failures; to design all new publicly owned buildings as public shelters or for other emergency purposes; to provide incentives for improving substandard properties and for eliminating non-conforming uses as it applies to hazard mitigation; to protect the shoreline by natural and man-made systems that are designed to reduce potential damages and erosion; to limit residential density increases within the coastal high hazard area; to identify hazardous substances located within the coastal high hazard area and measures taken to minimize the risk of releases; to retrofit existing schools to public shelter standards and construct all new schools to public shelter standards; and to use mitigation techniques to reduce the economic impacts of natural disasters.

Goal three tackles coordination issues by striving to maintain a program of intergovernmental and interagency coordination, cooperation and partnership to mitigate disasters, evaluate existing mitigation measures, and propose new or modified mitigation measures. Supporting objectives include: establishing frequent coordination among local governments and other groups regarding mitigation issues; establishing an intergovernmental and interagency group to evaluate the effectiveness of existing mitigation measures following a disaster and propose modifications to existing mitigation measures and/or propose new mitigation measures and strategies; developing strategies to have cooperation between the municipalities, the County, the School Board and other public and quasi-public entities within the County to coordinate mitigation efforts; developing and coordinating strategies to locate funding mechanisms and financial incentives to promote mitigation efforts; and developing channels of communication, programs, and partnerships with the business community to promote mitigation efforts.

Maintaining consistent language for outlining goals and objectives in both the LMS and comprehensive plan presents a united front on decreasing risk in the county. While the LMS may not be able to regulate land use as the comprehensive plan does, having these common goals and objectives increases the likelihood of the jurisdictions of Pinellas County adopting and implementing corresponding policies that are legally enforceable.

Comprehensive Emergency Operations Plan (CEMP)

The Pinellas County CEMP references the LMS in a section called "Mitigation and the Local Mitigation Strategy". The CEMP notes that all pre- and post-disaster mitigation activities are led by the County Department of Emergency Management. Pre-disaster priorities and projects are generated through the LMS. Post-disaster mitigation priorities consider the LMS analyses and project lists, in addition to damage assessment reports. It is recognized that since some damages may occur to facilities not part of the LMS, priorities may need to be reconsidered and the opportunity to accomplish a mitigation measure may need to be taken following a disaster. The CEMP discusses hazard mitigation in the context of standard operating procedures, activities, responsibilities and available programs. This includes the post-disaster implementation of the Hazard Mitigation Grant Program and related disaster mitigation, response and recovery assistance programs such as the National Flood Insurance Program and Community Rating System.

Though the identification of mitigation opportunities lies predominately with the County Emergency Management Department and the LMS working group, the document lists various activities and supporting agencies to assist in supporting mitigation in the County. The CEMP notes that county departments and municipalities are responsible for assessing damages to public infrastructure following a disaster, and then submitting recommended projects to the County or City Administrator who will determine if repairs should be made or mitigation measure(s) accomplished. The County Emergency Management Department will provide information to municipalities a, county departments and other eligible applicants regarding how to apply for available mitigation funding.

As such, the CEMP is a good tool for planners, which includes collaborative procedures for working with emergency managers to reduce vulnerability from hazards.

Post-Disaster Redevelopment Plan (PDRP)

The Pinellas County PDRP was not available for review at the time that this profile was developed.

National Flood Insurance Program/Community Rating System

Pinellas County and all of its municipalities participate in the National Flood Insurance Program (NFIP). Pinellas County as well as 20 of its municipalities also participates in the NFIP Community Rating System (CRS). The municipalities of Belleair Beach, Clearwater, Gulfport, Indian Shores, Largo, Oldsmar, Pinellas Park, St. Petersburg, and Treasure Island currently have a CRS rating of seven (7). Pinellas County and the municipalities of Dunedin, Indian Rocks Beach, Madeira Beach, North Redington Beach, Redington Beach, Redington Shores, Safety Harbor, South Pasadena, St. Pete Beach, and Tarpon Springs currently have a CRS rating of eight (8). Kenneth City currently has a CRS rating of nine. The municipalities of Belleair, Belleair Bluffs, Belleair Shore, and Seminole do not currently participate in the CRS program.

4. Comprehensive Plan Review

Purpose and Intent

The Pinellas County Comprehensive Plan (adopted February 17, 1998; Amendment dates following summary) was reviewed for the purpose of developing this profile. This review was undertaken in order to assess what steps Pinellas County has taken to integrate hazard mitigation initiatives from their Local Mitigation Strategy (LMS) and hazard mitigation initiatives in general, into the local planning process. Each Element of the Plan was evaluated to establish the extent to which the principles from the LMS were incorporated into the objectives and policies of the existing Comprehensive Plan.

Approach

This review includes an assessment of tropical cyclone generated storm surge, flooding, wildfire, and sinkhole hazards. A preliminary list of objectives and policies currently contained in the Plan that pertain to hazard mitigation and any policies related to these hazards is found in **Attachment G**. The following is a discussion of the extent to which the Plan appears to address each of the hazards. Recent policy amendments may not have been available for review, or proposed policies might be in the process of creation, which address these hazards. As a result, this assessment is considered preliminary and subject to input from the local government.

Summary of Findings

The highest risk hazards for Pinellas County as identified in the County's Local Mitigation Strategy (LMS) are hurricanes and tropical storms, erosion, tornadoes, wildfire, and flooding (coastal and rainfall). Sinkholes and wildfire were discussed in the LMS, but the risk was considered to be moderate to low for the entire county for these hazards. However, the Comprehensive Plan included a number of objectives and policies related to sinkhole hazard mitigation, sufficient to warrant a discussion of those policies in this assessment. Although there are policies related to fire protection in the Comprehensive Plan, policies specifically related to wildfire mitigation were limited in the Plan.

Pinellas County is a coastal county, so emergency management and hazard mitigation policies primarily address hurricane evacuation and storm surge mitigation, flooding, and coastal resource protection. Plan policies mandate an intergovernmental approach to the implementation of hazard mitigation measures to reduce the exposure of human life and property to natural hazards. The Comprehensive Plan focuses on the protection of floodplains, wetlands, and dune systems through land development regulations, and restrictions on densities and infrastructure in the Coastal High Hazard Area (CHHA). The Plan also relies heavily on land development regulations and local hazard mitigation and redevelopment plans for policy implementation.

Storm Surge, Evacuation and Sheltering

Policies state that Pinellas County will continue to implement existing hazard mitigation programs including: shoreline restoration and enhancement, building code and floodplain regulations, land use, zoning, and subdivision regulations, and other applicable hazard mitigation measures. These policies mandate that on an annual basis, the County's existing hazard mitigation programs will be reviewed to reduce the vulnerability of future development in the CHHA. This review will evaluate the recommendations of existing interagency hazard mitigation reports and the Pinellas County Comprehensive Emergency Management Plan.

In order to limit exposure of residents and property to coastal hazards and to prevent an increase in pressure on hurricane evacuation corridors and public shelters, population density and development intensity within the coastal planning area must be consistent with the Coastal Management Element. Further, Land Development Regulations must require that the level of population density and development intensity in the coastal planning area be compatible with evacuation capabilities. Pinellas County will not approve any request for residential density above 5.0 units per gross acre for areas within the CHHA, identified as the Evacuation Level A areas in the most recent regional hurricane evacuation study. In addition, new development will be prohibited in the frontal dune and beach area.

The location of critical facilities and properties vulnerable to storms (i.e., mobile homes) are high priorities in the Comprehensive Plan. The County will prohibit the location of new, or the expansion of existing hospitals, nursing homes, and assisted living facilities within the CHHA, and discourage these facilities within the Evacuation Level B area. The siting of new mobile homes or expansion of existing mobile home development within the CHHA will be prohibited.

In order to facilitate safe and timely evacuation, Pinellas County will ensure the availability of adequate transportation facilities in high risk areas, consistent with the Hurricane Evacuation Plan. The County will cooperate with Tampa Bay Regional Planning Council to educate the public on proper hurricane evacuation procedures. The County will also publish and make a hurricane preparedness handbook available to the general public prior to June 1 of each year.

Pursuant to the Capital Improvements Element, Pinellas County will annually evaluate projects proposed for inclusion on the Six-Year Schedule of Improvements and place a high priority on capital improvement projects related to critical links and evacuation routes. The County will coordinate with the Florida Department of Transportation during preparation of the Transportation Improvement Plan for District 7 to encourage the State to give priority to road improvement projects on regional hurricane evacuation routes.

Development or redevelopment in storm impact areas will be restricted based upon National Disaster Planning objectives and consistent with the criteria in Damage Prevention and Flood Plain Management provisions in the County Code. The Local Planning Agency will review interagency hazard mitigation report recommendations related to land uses susceptible to damage by natural hazard, and make recommendations to the Board related to Future Land Use Map changes and/or Plan policies considered critical to reducing, or mitigating, such hazard.

Policies address the implementation of a Post-Disaster Redevelopment Plan (PDRP) as part of the Pinellas County Comprehensive Emergency Management Plan. The PDRP will include guidelines and criteria for determining priorities for acquiring storm-damaged property in the CHHA. The Plan will establish criteria to evaluate options for repairing, replacing, modifying or relocating public and private facilities and infrastructure within coastal high-hazard areas.

According to Florida's Statewide Emergency Shelter Plan, Pinellas County had a shelter deficit of 93,527 people in 2004. The opportunity exists to construct new facilities to standards that will allow them to serve as shelters, and to construct future public facilities outside of floodplain and storm surge areas. The deficit for this County is significant and will need attention as future policies are developed and implemented.

According to the Comprehensive Plan, the County supports a cooperative and regional approach to disaster planning and to resolution of the existing emergency shelter deficit. Hurricane evacuation policies state that Pinellas County will cooperate with the State Division of Emergency Management to coordinate multi-county evacuations in a manner consistent with the Pinellas County Hurricane Evacuation Implementation Guide. Pinellas County will also cooperate with state and regional agencies, and with other local governments to maintain or reduce hurricane clearance times as a component of the evacuation times for Pinellas County.

To address the shelter deficit, whenever possible, new or expanded county buildings will be located, designed, and constructed so that they may be utilized for hurricane shelters. The County will assist Pinellas County Red Cross in the development of a countywide plan to increase County public shelter spaces. Pinellas County will also expand coordination efforts with the County School Board so school facilities will be located and designed to provide shelters. According to Plan policies, public education provides the opportunity to promote alternatives to traditional public sheltering. Alternatives will include host home programs, inland sheltering, retrofitting of existing structures, utilizing refuges of last resort as appropriate, and evacuation of guests from transient accommodations to inland "sister" transient accommodations.

Flooding

Flooding is addressed from two vantage points, the protection of natural drainage features, and protection of properties through development standards and stormwater abatement. There are extensive policies directed at minimizing flooding and stormwater runoff, and protecting flood prone areas from potential development impacts. One policy example is that Land Development Code provisions regulating development or redevelopment in flood-prone areas will be reviewed

and amended based on criteria of the National Flood Insurance Program. Policies also state that the County cannot approve any request to increase residential density above 5.0 units per acre for areas within l00-year floodplains.

Many policies related to flood mitigation involve strategic stormwater abatement. In implementing or revising the Pinellas County Stormwater Management Plan, the County will support the use of natural alternatives, the conservation and restoration of natural drainage systems, and the protection and improvement of the quality of receiving waters. Pinellas County Stormwater Management Plan projects within the Tampa Bay watershed will support and further the goals of the Comprehensive Conservation and Management Plan (CCMP) for Tampa Bay.

Policies reference preparation of watershed or waterbody management plans by County staff, for approval and implementation by the Board of County Commissioners. These plans address water quality, stormwater management, habitat, and biological targets, and recommended funding sources for implementation.

Wildfire

The Pinellas County Comprehensive Plan is limited in fire mitigation goals, objectives and policies. There is a policy addressing structures damaged by fire or natural forces in the PDRP. The policy states that to the extent that the cost of reconstruction or repair exceeds 50 percent of the structure's market value before the damage occurred, the structure shall be rebuilt to meet all applicable federal, state and local regulations. No additional policies related to urban wildfire were found in the Plan.

Sinkholes

There are objectives and policies in the Natural, Historic and Cultural Resources Element which pertain to sinkhole identification and documentation. Objective 1.1 states that information on areas with high sinkhole/subsidence susceptibility must be made available for use in County planning and private land development. The corresponding policy states that Pinellas County will publicize the availability of information on areas with high sinkhole / subsidence susceptibility at County offices by January 1, 1998.

Comprehensive Plan Amendments:

(Amended April 21, 1998)
(Amended on March 16, 1999)
(Amended on June 15, 1999)
(Amended on August 31, 1999)
(Amended October 19, 1999)
(Amended May 16, 2000)
(Amended November 21, 2000)
(Amended August 7, 2001)
(Amended May 7, 2002)
(Amended October 15, 2002)
(Amended May 6, 2003)
(Amended April 27, 2004)
(Amended December 21, 2004)
(Amended November 15, 2005)

5. Municipal Case Study – City of Madeira Beach

As part of this study, a similar analysis was completed for a statewide sample of 14 Florida municipalities, including Madeira Beach in Pinellas County. The results of this analysis are provided within this section.

Hazards Analysis

The following analysis examines three hazard types: surge from tropical cyclones, flood, and wildfire. No population or structures were determined to be exposed to sinkholes. All of the information in this section was obtained through the online Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS).

Existing Population Exposure

Table 5.1 presents the population of Madeira Beach that is exposed to each hazard, as well as a breakdown of the sensitive needs population exposure.

Of the 4,511 (U.S. Census 2000) people that reside in the City of Madeira Beach, 99.8% are exposed to storm surge, 99.8% are exposed to 100-year flooding, and 44.9% are exposed to wildfire. Of the 4,500 people exposed to surge, 45.1% are disabled. Of the 4,500 people exposed to flood, 45.1% are disabled and 21.9% are over age 65. Of the 2,024 people exposed to wildfire, 32.2% are disabled and 20% are over age 65.

Table 5.1 Estimated Number of Persons Exposed to Hazards in Madeira Beach

Segment of Population	Storm Surge**	Flood	Wildfire
Total (all persons)*	**4,500**	**4,500**	**2,024**
Minority	115	115	10
Over 65	987	987	405
Disabled	2,029	2,029	651
Poverty	439	439	139
Language-Isolated	706	655	54
Single Parent	190	190	135

Source: Mapping for Emergency Management, Parallel Hazard Information System

*Note: The "Total" amount does not equal the sum of all segments of the population, but indicates the total population at risk to the selected hazards.
**Note: Storm surge related flooding population exposure results are a subset of the flood results.

While the concern for human life is always highest in preparing for a natural disaster, there are also substantial economic impacts to local communities, regions, and even the state when property damages are incurred. To be truly sustainable in the face of natural hazards, we must work to protect the residents and also to limit, as much as possible, property losses that slow down a community's ability to bounce back from a disaster. **Table 5.2** presents estimates of the number of structures in Madeira Beach by occupancy type that are exposed to each of the hazards being analyzed. The estimated exposure of Madeira Beach existing structures to the storm surge, flood, and wildfire hazards was determined through MEMPHIS.

There are 10,414 structures exposed to at least one of the three hazards, of which most are multi-family dwellings. Of these structures, 97.5% are exposed to flood. Over 10,000 structures are located within the 100-year floodplain, of which 42.2% are exposed to storm surge induced flooding. As of March 2005, there are 186 repetitive loss properties in Madeira Beach.

Table 5.2 also indicates that there are 258 structures exposed to wildfire, of which nearly 69% are multi-family homes.

Table 5.2 Estimated Number of Structures Exposed to Hazards in Madeira Beach

Occupancy Type	Storm Surge*	Flood	Wildfire
Single Family	1,384	3,682	71
Mobile Home	4	2,903	7
Multi-Family	2,687	2,857	177
Commercial	171	567	3
Agriculture	0	129	0
Gov. / Institutional	37	18	0
Total	**4,283**	**10,156**	**258**

Source: Mapping for Emergency Management, Parallel Hazard Information System

*Note: Storm surge related flooding building exposure results are a subset of the flood results.

In addition to understanding exposure, risk assessment results must also be considered for prioritizing and implementing hazard mitigation measures. The risk assessment takes into account the probability (how often) and severity (e.g., flood depth, storm surge velocity, wildfire duration) of the hazard as it impacts people and property. Risk can be described qualitatively, using terms like high, medium or low; or quantitatively by estimating the losses to be expected from a specific hazard event expressed in dollars of future expected losses. Although people and property are exposed to hazards, losses can be greatly reduced through building practices, land use, and structural hazard mitigation measures. The next section of this report examines the existing and future land use acreage in hazard areas. This information can be useful to consider where to implement risk reducing comprehensive planning measures.

Analysis of Current and Future Vulnerability Based on Land Use

The previous hazards analysis section discussed population and existing structures exposed to surge, flood, and wildfire according to MEMPHIS estimates. This section is used to demonstrate the City's vulnerabilities to these hazards in both tabular format and spatially, in relation to existing and future land uses. Existing land use data was acquired from County Property Appraisers and the Florida Department of Revenue in 2004 for tabulation of the total amount of acres and percentage of land in identified hazard areas, sorted by existing land use category for the unincorporated areas. The total amount of acres and percentage of land in the identified hazards areas was tabulated and sorted by future land use category according to the local Future Land Use Map (FLUM), as well as the amount of these lands listed as vacant according to existing land use. Madeira Beach's future land use data (which uses generalized future land use classification system on Pinellas County countywide FLUM created by the Pinellas Planning Council) was acquired in September 2002 from the Pinellas Planning Council and might not reflect changes per recent future land use amendments. Maps of existing land use within hazard areas are based on the 2004 County Property Appraiser geographic information system (GIS) shapefiles. Maps of future land uses in hazard areas were developed using the City of Madeira Beach future land use map dated September 2002. A series of maps were created as part of the analysis and are available as attachments to the county profile. All maps are for general planning purposes only.

For the purposes of this profile, the identified hazard areas include the coastal hazards zone in relation to storm surge, hurricane vulnerability zones in relation to evacuation clearance times, flood zones in relation to the 100-year flood, wildfire susceptible areas, and sinkhole susceptible areas.

In **Attachment A**, two maps present the existing and future land uses within the Coastal Hazards Zone (CHZ), which represents the Category 1 Hurricane Evacuation Zone joined with the Category 1 Storm Surge Zone. Most of Madeira Beach is located in surge-prone areas. The total amount of land in the CHZ is 361.9 acres. As shown in **Table 5.3**, 37.3% are used for residential single-family homes; 17.5% are currently undeveloped; 15.3% are used for residential multi-

family housing; and 14% are used for government, institutional, hospitals or education purposes. **Table 5.4** shows that of the 63.3 undeveloped acres, 53.9% are designated for resort facilities (medium) development. The City has the opportunity to implement existing mitigation measures to reduce storm surge damage by maintaining or reducing density in the Coastal High Hazard Area, or additional mitigation measures such as elevating structures above the NFIP "V" and "Coastal A" zone requirements.

In **Attachment B**, two maps present the existing and future land uses within the Hurricane Vulnerability Zone (HVZ), which represents Category 1 to 3 Hurricane Evacuation Zones. Most of Madeira Beach is located in the HVZ. The total amount of land in the HVZ is 363.2 acres. As shown in **Table 5.3**, 37.1% are used for residential single-family homes; 17.5% are currently undeveloped; 15.3% are used for residential multi-family housing; and 14% are used for government, institutional, hospitals or education purposes. **Table 5.4** shows that of the 63.5 undeveloped acres, 53.7% are designated for resort facilities (medium) development. The City has the opportunity to implement existing mitigation measures to reduce storm surge damage by maintaining or reducing density in the Coastal High Hazard Area, or additional mitigation measures such as elevating structures above the NFIP "V" and "A" zone requirements.

In **Attachment C**, two maps present the existing and future land uses within a 100-year flood zone. There are flood-prone areas scattered across the City, as the City is located on an island and is surrounded by water. The total amount of land in the special flood hazard area is 437.6 acres. As shown in **Table 5.3**, 38.7% are used for residential single-family homes; 19.3% are currently undeveloped; 14.1% are used for residential multi-family housing; and 13.3% are used for government, institutional, hospitals or education purposes. **Table 5.4** shows that of the 84.3 undeveloped acres, 48.6% are designated for resort facilities (medium) development. The City has the opportunity to implement existing mitigation measures to reduce flood damage such as requiring new development to adhere to the master stormwater management plan, or additional mitigation measures such as elevating structures above the NFIP "A" zone requirements (i.e., freeboard).

According to the land use analysis, no acreage was identified as being within a wildfire susceptible area. However, MEMPHIS data shows that there are structures exposed to this hazard. It is recommended that the City of Madeira Beach conduct further analysis using local data to determine the risk to the wildfire hazard in the City.

According to the land use analysis, no acreage was identified as being within a sinkhole susceptible area.

Table 5.3 Total Incorporated Madeira Beach Acres in Hazard Areas by Existing Land Use Category

Existing Land Use Category		Coastal Hazard Zone	Hurricane Vulnerability Zone	Flood Zones
Attractions, Stadiums, Lodging	Acres	9.6	9.6	11.1
	%	2.7	2.6	2.5
Places of Worship	Acres	1.3	1.3	1.8
	%	0.4	0.4	0.4
Commercial	Acres	40.8	41.2	42.4
	%	11.3	11.3	9.7
Government, Institutional, Hospitals, Education	Acres	50.8	50.8	58.2
	%	14.0	14.0	13.3
Industrial	Acres	0.4	1.3	1.3
	%	0.1	0.4	0.3
Parks, Conservation Areas, Golf Courses	Acres	0.4	0.4	0.2
	%	0.1	0.1	0.0
Residential Group Quarters, Nursing Homes	Acres	0.2	0.2	0.2
	%	0.1	0.1	0.0
Residential Multi-Family	Acres	55.5	55.5	61.8
	%	15.3	15.3	14.1
Residential Single-Family	Acres	134.9	134.7	169.4
	%	37.3	37.1	38.7
Submerged Land (Water Bodies)	Acres	0.4	0.4	0.9
	%	0.1	0.1	0.2
Transportation, Communication, Rights-Of-Way	Acres	2.5	2.5	4.2
	%	0.7	0.7	1.0
Utility Plants and Lines, Solid Waste Disposal	Acres	1.8	1.8	1.8
	%	0.5	0.5	0.4
Vacant	Acres	63.3	63.5	84.3
	%	17.5	17.5	19.3
Total Acres	**Acres**	**361.9**	**363.2**	**437.6**
	%	**100.0**	**100.0**	**100.0**

Source: Department of Community Affairs

Table 5.4 Total Incorporated Madeira Beach Acres in Hazard Areas by Future Land Use Category

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones	
		Total	Vacant	Total	Vacant	Total	Vacant
Commercial General	Acres	54.6	10.3	59.3	13.6	66.0	16.9
	%	15.1	16.3	16.3	21.4	15.1	20.0
Industrial	Acres	19.6	0.0	19.6	0.0	24.1	0.0
	%	5.4	0.0	5.4	0.0	5.5	0.0
Preservation	Acres	3.8	3.6	0.7	0.4	8.7	7.6
	%	1.0	5.7	0.2	0.6	2.0	9.0
Recreation/ Open Space	Acres	26.8	0.4	26.8	0.4	27.9	0.2
	%	7.4	0.6	7.4	0.6	6.4	0.2
Residential High	Acres	1.3	1.3	1.3	1.3	2.0	2.0
	%	0.4	2.1	0.4	2.0	0.5	2.4
Residential Low	Acres	1.3	0.9	1.3	0.9	1.3	1.1
	%	0.4	1.4	0.4	1.4	0.3	1.3
Residential Medium	Acres	76.2	3.6	76.2	3.6	88.1	5.3
	%	21.0	5.7	21.0	5.7	20.1	6.3
Residential Urban	Acres	104.8	1.1	104.6	1.1	133.5	1.3
	%	29.0	1.7	28.8	1.7	30.5	1.5
Residential/ Office General	Acres	0.2	0.0	0.2	0.0	0.4	0.0
	%	0.1	0.0	0.1	0.0	0.1	0.0
Residential/ Office/ Retail	Acres	18.5	7.6	18.5	7.6	18.1	8.0
	%	5.1	12.0	5.1	12.0	4.1	9.5
Resort Facilities Medium	Acres	51.3	34.1	51.3	34.1	62.9	41.0
	%	14.2	53.9	14.1	53.7	14.4	48.6
Transportation/ Utilities	Acres	3.6	0.4	3.6	0.4	4.0	0.4
	%	1.0	0.6	1.0	0.6	0.9	0.5
Water	Acres	0.0	0.0	0.0	0.0	0.7	0.2
	%	0.0	0.0	0.0	0.0	0.2	0.2
Total Acres	**Acres**	**362.0**	**63.3**	**363.4**	**63.5**	**437.6**	**84.3**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Department of Community Affairs

Municipal Hazard Mitigation Goals and Objectives Related to Comprehensive Planning

The Pinellas County LMS contains a list of "Mitigation Initiatives" that pertain directly to the City of Madeira Beach. Each of these initiatives also references the anticipated cost of the measure. The mitigation initiatives specifically mentioned for the City of Madeira Beach include the installation of emergency storm shutters at Harden City Hall; upgrade to create a secondary EOC (Nations Bank is located outside of the evacuation zone); flood-proofing at the existing City Hall Complex and Public Works Department and harden the building against hurricane force winds; and install 20 flap valves to reduce tidal backup into storm drains.

Comprehensive Plan Review

Purpose and Intent

The City of Madeira Beach Comprehensive Plan (adopted September 5, 1999) was reviewed for the purpose of developing this profile. This review was undertaken in order to assess what steps Madeira Beach has taken to integrate hazard mitigation initiatives from their Local Mitigation Strategy (LMS) and hazard mitigation initiatives in general, into the local planning process. Each Element of the Plan was evaluated to establish the extent to which the principles from the LMS were incorporated into the objectives and policies of the existing Comprehensive Plan.

Approach

This review includes an assessment of tropical cyclone generated storm surge and flooding hazards. A preliminary list of objectives and policies currently contained in the Plan that pertain to hazard mitigation and any policies related to these hazards is found in **Attachment H**. The following is a discussion of the extent to which the Plan appears to address each of the hazards. Recent policy amendments may not have been available for review, or proposed policies might be in the process of creation, which address these hazards. As a result, this assessment is considered preliminary and subject to input from the local government.

Summary of Findings

The highest risk hazards for Madeira Beach as identified in the County's Local Mitigation Strategy (LMS) are coastal erosion, coastal flooding, and hurricanes and tropical storms. The LMS risk assessment indicated sinkholes and wildfire to be low risk hazards for Madeira Beach. Because the City is considered to have low risk to wildfire and sinkholes and no policies pertaining to these hazards were found in the City's Comprehensive Plan, the wildfire and sinkhole hazards are not addressed in this summary.

Madeira Beach is located on the coast in Pinellas County, so many policies are geared toward coastal management and environmental resource protection. Policies relating to hazard mitigation in the Plan include those addressing flooding, stormwater abatement, evacuation and sheltering, and surge mitigation.

Due to the geographic location of the City, primarily in the Coastal High Hazard Area (CHHA) and the 100-year floodplain, policies are geared toward coastal resource protection and hazard mitigation. There is a strong policy emphasis on both intergovernmental and intra-governmental coordination related to coastal resource management, hazard mitigation, and more specifically to hurricane evacuation. Policies expressly mandate the use of City land development regulations to guide development and to guard against further densification of the CHHA.

Storm Surge, Evacuation and Sheltering

Protection of coastal resources is emphasized both as a means to preserve natural communities and to mitigate for future natural disasters, primarily the hurricanes and flooding associated with those events. The Plan relies heavily on land development regulations for policy implementation, specific to coastal protection and hazard mitigation. These regulations will be the regulatory tools used to further protect coastal vegetative communities, coastal wildlife habitats, and dune systems from the adverse effects of development.

Intergovernmental coordination is a recurring theme in the Comprehensive Plan. Policies state that Madeira Beach will cooperate with the Pinellas County Department of Emergency Management, the Town of Redington Beach, the City of Seminole, and Pinellas County to implement the adopted *Hurricane Evacuation Plan.* There are also policies referencing uniformity in beach management and protection through coordination with adjoining municipalities.

Policies support the maintenance and/or reduction of densities due to the location of the City in the CHHA. The City will not increase densities above those established on the Comprehensive plan Future Land Use Map. In addition, the City will not support or finance new local transportation corridors or sewer and water line extensions encouraging growth or higher population densities within the CHHA beyond that anticipated in the Comprehensive Plan.

Public expenditures that subsidize development in the CHHA are limited to improvements anticipated in the Comprehensive Plan or those determined by the Board of City Commissioners to be an overriding public benefit. Policies also state the City will only expend funds on infrastructure and services in the CHHA in order to maintain adopted levels of service.

Special care facilities will not be located in the CHHA. Assisted living facilities are discouraged in the CHHA unless adequate provisions for safe and efficient evacuation and shelter are ensured. From a public information standpoint, the City will cooperate with the Pinellas County Department of Emergency Management and the South Pinellas County Chapter of the American Red Cross to sponsor preparedness seminars to increase hurricane awareness.

Policies dictate that the City shall maintain or reduce hurricane evacuation times. Through the Pinellas County Metropolitan Planning Organization (MPO), the City will coordinate with state, regional, and county agencies to ensure that major evacuation routes are maintained and, when necessary, improved to facilitate a safe evacuation. City emergency response personnel will also coordinate pre- and post-event activities with county and state emergency response agencies.

According to Florida's Statewide Emergency Shelter Plan, Pinellas County had a shelter deficit of 93,527 people in 2004. This shelter deficit includes the vulnerable population in Madeira Beach. The opportunity exists to construct new facilities to standards that will allow them to serve as shelters, and to construct future public facilities outside of floodplain and storm surge areas. The deficit for this County is significant and will need attention as future policies are developed and implemented.

The City will coordinate with the Pinellas County Department of Emergency Management to maintain and upgrade its comprehensive disaster plan, which addresses the four phases of comprehensive emergency management: preparedness, response, recovery and mitigation. The City Commission will review the *Pinellas County Comprehensive Emergency Management Plan* to ensure that hazard mitigation considerations are effective and implemented.

The Plan refers to the implementation of post-disaster response and recovery procedures outlined it the City's Disaster Plan. The City will implement reconstruction and redevelopment strategies, which will be used to promote hazard mitigation.

Flooding

Flooding is addressed from two vantage points, the protection of natural drainage features, and the protection of properties through development standards and stormwater abatement. Policies state that the City will establish a program for retrofitting the City system's existing deficiencies to conform to a master stormwater management plan. A list of existing deficiencies is included in the Comprehensive Plan.

Recognizing that the community is located within the 100-year floodplain, policies state that the City will continue to strictly enforce all appropriate federal, state, and regional coastal construction codes and coastal setback regulations. The City will also protect the natural functions of the 100-year floodplain so that flood-carrying and flood-storage capacities are maintained. One specific example of floodplain protection is that pilings rather than fill will be used to elevate structures located in flood prone areas.

Wildfire

Policies directly relating to wildfire hazard were not found during this review.

Sinkhole

Policies directly relating to sinkhole hazard were not found during this review

Summary of Preliminary Recommendations

The City of Madeira Beach's Comprehensive Plan has a good integration of hazard mitigation principles and its LMS has adequate data and goals to support comprehensive planning. However, there are always ways to strengthen such plans, and the following is a summary of options for the City to do so.

Comprehensive Plan Preliminary Recommendations

The following recommendations include hazard mitigation measures in which the City of Madeira Beach can continue to reduce or eliminate risks from storm surge and flood. These recommendations pertain to the use of vacant lands and/or redevelopment practices. Based on the land use tabulations, most of the vacant acreage is susceptible to flood and tropical cyclone generated storm surge. For more information about the methodology and data used for the land use tabulations, please refer to the "Analysis of Current and Future Vulnerability Based on Land Use" section of the Municipal Case Study in this hazards profile.

Of the vacant lands, 63 acres are susceptible to Category 1 storm surge (CHZ), 64 acres are susceptible to Category 1 – 3 storm surge (HVZ), and 84 acres are susceptible to 100-year flood. According to the land use analysis, no acreage was identified as being within wildfire or sinkhole susceptible areas. According to the Pinellas County LMS, the City of Madeira Beach is deemed to have a low risk from both wildfire and sinkhole hazards.

Storm Surge

About 93% of the 63 vacant acres in the Coastal Hazard Zone and 64% of the 98 vacant acres in the Hurricane Vulnerability Zone are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The City should continue using land development regulations to limit development on barrier islands and protect coastal vegetative communities and dune systems from adverse effects of development; and considering marine wetlands and barrier island property as priorities for environmental land acquisition, which will reduce surge risk by not developing in these high-risk areas; and seeking opportunities for public land acquisition in the CHHA.
- The City should continue limiting public expenditures that support development in the CHHA, such as not supporting or financing new local transportation corridors or sewer and water line extensions or expansions.
- The City should continue maintaining or reducing density in the CHHA consistent with the Future Land Use Map LU-4; and prohibiting special care facilities such as hospitals and nursing homes in the CHHA.
- The City should continue to encourage, through the use of public education, planting native marine vegetation in front of seawalls to act as a natural buffer from tides, adopt beach management practices to regulate excavations and disturbance of natural vegetation that affect dunes, and continue a program to restore and maintain coastal dune systems.

- The City should continue coordinating beach management practices with neighboring communities, and reviewing comprehensive plans of neighboring communities to determine if coastal resources on barrier islands are being consistently managed,
- The City should continue coordinating with state, regional and county agencies, through the MPO, to ensure that major evacuation routes are adequately maintained and improved for safe and efficient evacuations.
- The City should consider limiting residential population centers within the CHHA to areas that can accommodate such development through provision of adequate evacuation capability, as long as development meets storm velocity standards and does not measurably increase the established evacuation clearance time.
- The City should, in the CHHA, should consider prohibiting septic tanks; flood-proofing portable water and sanitary sewage facilities and not accepting responsibility for maintaining new roadways or taking over maintenance of existing roadways, unless designated on the Long Range Transportation Map; and other existing measures to minimize surge risk.
- The Comprehensive Plan should consider transfer of development rights from areas within the CHHA to outside the CHHA, as another measure to reduce density in the CHHA.
- Comprehensive Plan policies should consider retrofitting essential public facilities that exist in the CHHA to mitigate impacts from surge.
- The City should consider coordinating with Pinellas County to only allow new shelters (including on-site shelters) outside of the HVZ.
- The City should consider denying requests for residential density increases within the CHHA, above what is already included on the Future Land Use Map.
- The Comprehensive Plan should consider a policy to institute a level of service (LOS) standard for evacuation route capacity that is tied to levels of development or population and/or institute an impact fee in the CHHA or HVZ to help pay for additional road capacity, retrofits required for evacuations, and shelter space.

Flood

About 84% of the 90 vacant acres in the 100-year floodplain are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The City should continue implementing land development regulations that contain administrative provisions for flood hazard safety; incorporate natural drainage features and the minimization of surface cover vegetation loss to reduce flooding through stormwater management requirements; protect natural features for flood carrying and flood storage capacity of the 100-year floodplain; and provisions to protect life and property from flooding.
- The City should continue requiring that the discharge rate for post-developed or re-developed sites shall not exceed peak flow and volume under pre-development conditions; and incorporating management techniques to limit impervious on any parcel or lot, and regularly maintaining retention swales adjacent to city roadways to reduce or eliminate flooding.
- The City should continue protecting water storage of wetlands and floodplain areas through land acquisition, enforcement of laws, and land and water management practices.
- The City should continue requiring that pilings, not fill be used to elevate structures in floodprone areas.
- The City should continue coordinating with Pinellas County for joint projects identified in the municipal stormwater management plan and the Pinellas County Stormwater Management Plan.

- The City should consider implementing policies for restricting net encroachment of significant wetland resources, and clustering development to increase open space to protect floodplains.
- The City should consider coordinating with Pinellas County to build shelters and essential public facilities outside of the 100-year floodplain.
- The City should consider including a policy for reducing repetitive (flood) loss properties such as at risk property acquisition or elevation.
- The County should consider including a policy for reducing future losses through transfers of development right from areas within the 100-year floodplain to areas outside the 100-year floodplain, and imposing density and intensity limitations in the 100-year floodplain.
- The City should consider including a policy to not approve variances to required flood elevations.
- The City should consider establishing an impact fee and/or other equitable user-oriented revenue sources for the construction of drainage facilities, either county-wide or in districts of high flooding potential.
- The City should consider the requirement for the installation of back-flow preventers on new septic tanks in the 100-year floodplain to mitigate impacts from flood, or create incentives and disincentives to reduce the desirability of septic installation within the 100-year floodplain.
- The City should consider requiring that all structures built in the 100-year floodplain include at least 1 foot freeboard. Many post-disaster building performance/damage assessments have shown that it is advisable to include freeboard to reduce future flood damages. Okaloosa and Brevard Counties, City of Jacksonville and the Santa Rosa Island Authority are example communities that have adopted freeboard requirements.
- The City should consider requiring that stormwater management planning and construction of capital improvements coincide with stormwater drainage requirements to adequately address growth and development.
- The City should consider requiring that developers incorporate wetland portions of sites within the 100-year floodplain as conservation easements.
- The City should consider requiring that the maintenance and operation of private stormwater systems is funded by private sources, if applicable.
- The City should consider requiring areas that have not established base flood elevations to be studied prior to development.
- The City should consider calling for compensating storage calculations in all non coastal flood hazard areas.

Wildfire

Wildfire risk was considered to be very low in the hazards analysis in the latest version of the Pinellas County LMS.

Wildfire hazards could be evaluated further in the next update of the hazards analysis of the LMS to determine the risk. However, based on available data, it appears that wildfire risk is very low.

Sinkhole

Sinkhole risk was considered to be very low in the hazards analysis in the latest version of the Pinellas County LMS.

Sinkhole hazards could be evaluated further in the next update of the hazards analysis of the LMS to determine the risk. However, based on available data, it appears that sinkhole risk is very low.

General

- The City should continue coordinating with neighboring municipalities, Pinellas County, and the Tampa Bay Regional Planning Council to reduce exposure to natural hazards.
- Include each hazard layer on the existing and future land use maps to determine where risks are possible to target hazard mitigation strategies.
- The Comprehensive Plan should consider including a policy to incorporate recommendations from existing and future interagency hazard mitigation reports into the Comprehensive Plan during the Evaluation and Appraisal Report process as determined feasible and appropriate by the Board of City Commissioners.
- The Comprehensive Plan should consider including a policy to incorporate applicable provisions of the Comprehensive Plan into the Comprehensive Emergency Management Plan and the Local Mitigation Strategy.
- Continue educating the public, especially those at high risk from hurricanes and floods, & make them aware of proactive steps they can take to mitigate damage.

6. Municipal Case Study – City of St. Petersburg

As part of this study, a similar analysis was completed for a statewide sample of 14 Florida municipalities, including St. Petersburg in Pinellas County. The results of this analysis are provided within this section.

Hazards Analysis

The following analysis examines two hazard types: surge from tropical cyclones and sinkholes. Information regarding population or structure exposure to wildfire and flood hazards was not available at the time of this writing. All of the information in this section was obtained through the online Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS).

Existing Population Exposure

Table 6.1 presents the population of St. Petersburg that is exposed to each storm surge and sinkholes, as well as a breakdown of the sensitive needs population exposure.

Of the 248,232 (U.S. Census 2000) people that reside in the City of St. Petersburg, 17.5% are exposed to storm surge and 9.3% are exposed to sinkholes. Of the 43,498 people exposed to surge, 31.8% are disabled and 23.4% are over age 65. Of the 23,185 people exposed to sinkhole, 43.4% are disabled and 27.4% are minorities.

Table 6.1 Estimated Number of Persons Exposed to Hazards in St. Petersburg

Segment of Population	Storm Surge**	Sinkhole
Total (all persons)*	**43,498**	**23,185**
Minority	8,104	6,343
Over 65	10,162	2,978
Disabled	13,831	10,073
Poverty	3,090	3,008
Language-Isolated	0	0
Single Parent	2,127	2,039

Source: Mapping for Emergency Management, Parallel Hazard Information System

*Note: The "Total" amount does not equal the sum of all segments of the population, but indicates the total population at risk to the selected hazards.
**Note: Storm surge related flooding population exposure results are a subset of the flood results.

While the concern for human life is always highest in preparing for a natural disaster, there are also substantial economic impacts to local communities, regions, and even the state when property damages are incurred. To be truly sustainable in the face of natural hazards, we must work to protect the residents and also to limit, as much as possible, property losses that slow down a community's ability to bounce back from a disaster. **Table 6.2** presents estimates of the number of structures in St. Petersburg by occupancy type that are exposed to each of the hazards being analyzed. The estimated exposure of St. Petersburg existing structures to the storm surge and sinkhole hazards was determined through MEMPHIS.

There are 26,714 structures exposed to at least one of the two hazards, of which most are single-family homes in subdivisions. Of these structures, 44.8% are exposed to surge. As of March 2005, there are 393 repetitive loss properties in St. Petersburg.

Table 6.2 also indicates that there are 8,404 structures exposed to sinkholes, of which 77.3% are single-family homes.

Table 6.2 Estimated Number of Structures Exposed to Hazards in St. Petersburg

Occupancy Type	Storm Surge*	Sinkhole
Single Family	10,950	6,499
Mobile Home	227	29
Multi-Family	6,490	1,480
Commercial	524	315
Agriculture	0	80
Gov. / Institutional	119	1
Total	**18,310**	**8,404**

Source: Mapping for Emergency Management, Parallel Hazard Information System

*Note: Storm surge related flooding building exposure results are a subset of the flood results.

In addition to understanding exposure, risk assessment results must also be considered for prioritizing and implementing hazard mitigation measures. The risk assessment takes into account the probability (how often) and severity (e.g., flood depth, storm surge velocity, wildfire duration) of the hazard as it impacts people and property. Risk can be described qualitatively, using terms like high, medium or low; or quantitatively by estimating the losses to be expected from a specific hazard event expressed in dollars of future expected losses. Although people and property are exposed to hazards, losses can be greatly reduced through building practices, land use, and structural hazard mitigation measures. The next section of this report examines the existing and future land use acreage in hazard areas. This information can be useful to consider where to implement risk reducing comprehensive planning measures.

Analysis of Current and Future Vulnerability Based on Land Use

The previous hazards analysis section discussed population and existing structures exposed to surge and sinkholes according to MEMPHIS estimates. This section is used to demonstrate the City's vulnerabilities to these hazards in both tabular format and spatially, in relation to existing and future land uses. Existing land use data was acquired from County Property Appraisers and the Florida Department of Revenue in 2004 for tabulation of the total amount of acres and percentage of land in identified hazard areas, sorted by existing land use category for the unincorporated areas. The total amount of acres and percentage of land in the identified hazards areas was tabulated and sorted by future land use category according to the local Future Land Use Map (FLUM), as well as the amount of these lands listed as vacant according to existing land use. St. Petersburg's future land use data (which uses generalized future land use classification system on Pinellas County countywide FLUM created by the Pinellas Planning Council) was acquired in September 2002 from the Pinellas Planning Council and might not reflect changes per recent future land use amendments. Maps of existing land use within hazard areas are based on the 2004 County Property Appraiser geographic information system (GIS) shapefiles. Maps of future land uses in hazard areas were developed using the City of St. Petersburg future land use map dated September 2002. A series of maps were created as part of the analysis and are available as attachments to the county profile. All maps are for general planning purposes only.

For the purposes of this profile, the identified hazard areas include the coastal hazards zone in relation to storm surge, hurricane vulnerability zones in relation to evacuation clearance times, flood zones in relation to the 100-year flood, wildfire susceptible areas, and sinkhole susceptible areas.

In **Attachment A**, two maps present the existing and future land uses within the Coastal Hazards Zone (CHZ), which represents the Category 1 Hurricane Evacuation Zone joined with the Category 1 Storm Surge Zone. The areas that are most susceptible to storm surge are located along the east coast adjacent to Tampa Bay. The total amount of land in the CHZ is 6,503.3 acres. As shown in **Table 6.3**, 36.5% are used for residential single-family homes; 18.6% are parks, conservation areas and golf courses; 16.3% are currently undeveloped; and 14.7% are used for government, institutional, hospitals or education purposes. **Table 6.4** shows that of the

1,057.6 undeveloped acres, 32.7% are designated for residential (medium) development. The City has taken favorable action in limiting 32.7% of the acres as medium density residential development , and has the opportunity to implement mitigation measures to reduce storm surge damage to residential structures such as elevating structures above the NFIP "V" and "Coastal A" zone requirements.

In **Attachment B**, two maps present the existing and future land uses within the Hurricane Vulnerability Zone (HVZ), which represents Category 1 to 3 Hurricane Evacuation Zones. About 40% of the City of St. Petersburg is located within the HVZ, predominantly along Tampa Bay and in the northern portions of the City. The total amount of land in the HVZ is 13,911.7 acres. As shown in **Table 6.3**, 35.1% are used for residential single-family homes; 16.1% are currently undeveloped; 15.3% are used for government, institutional, hospitals or education purposes; and 11.1% are parks, conservation areas and golf courses. **Table 6.4** shows that of the 2,234.9 undeveloped acres, 28.6% are designated for residential (medium) development. The City has taken favorable action in limiting 28.6% of the acres as medium density residential development, and has the opportunity to implement mitigation measures to reduce storm surge damage to residential structures such as elevating structures above the NFIP "V" and "A" zone requirements.

In **Attachment C**, two maps present the existing and future land uses within a 100-year flood zone. Flood-prone areas are particularly located along Tampa Bay and in the northern portions of the City. The total amount of land in the special flood hazard area is 12,887.1 acres. As shown in **Table 6.3**, 35.1% are used for residential single-family homes; 16.6% are currently undeveloped; 14.9% are used for government, institutional, hospitals or education purposes; and 11.3% are parks, conservation areas and golf courses. **Table 6.4** shows that of the 2,141.7 undeveloped acres, 28.2% are designated for residential (medium) development. The City has taken favorable action in limiting 28.2% of the acres as medium density residential development, and has the opportunity to implement mitigation measures to reduce flood damage to residential structures such as elevating structures above the NFIP "A" zone requirements (i.e., freeboard).

In **Attachment D**, two maps present the existing and future land uses within wildfire susceptible areas. There are only a few spots of wildfire susceptible areas which are scattered across the City. The total amount of land in the wildfire susceptible areas is 465.3 acres. As shown in **Table 6.3**, 34.6% are currently undeveloped; 23.1% are used for government, institutional, hospitals or education purposes; 15.2% are used for residential single-family homes; and 12.8% are used for residential multi-family housing. **Table 6.4** shows that of the 161.2 undeveloped acres, 47% are designated for light industrial use. The City should continue to take measures to reduce wildfire risk within the urban/rural interface.

In **Attachment E**, two maps present the existing and future land uses within sinkhole susceptible areas. There are concentrated areas of sinkhole susceptibility located in the northern, central, and southern portions of the City. The total amount of land in the sinkhole susceptible areas is 2,339.8 acres. As shown in **Table 6.3**, 51.3% are used for residential single-family homes; 12.7% are used for residential multi-family housing; 11.2% are used for commercial purposes; and 8.4% are currently undeveloped. **Table 6.4** shows that of the 195.5 undeveloped acres, 44.6% are designated for residential (medium) development. The City has the opportunity to further research sinkhole vulnerability to determine if mitigation measures are necessary.

Table 6.3 Total Incorporated St. Petersburg Acres in Hazard Areas by Existing Land Use Category

Existing Land Use Category		Coastal Hazard Zone	Hurricane Vulnerability Zone	Flood Zones	Wildfire Susceptible Areas	Sinkhole Susceptible Areas
Attractions, Stadiums, Lodging	Acres	16.7	46.8	40.4	3.6	9.1
	%	0.3	0.3	0.3	0.8	0.4
Places of Worship	Acres	78.9	158.1	143.3	2.9	48.8
	%	1.2	1.1	1.1	0.6	2.1
Commercial	Acres	131.8	776.2	741.5	15.2	262.2
	%	2.0	5.6	5.8	3.3	11.2
Government, Institutional, Hospitals, Education	Acres	953.5	2,126.3	1,925.0	107.5	91.6
	%	14.7	15.3	14.9	23.1	3.9
Industrial	Acres	20.5	264.6	248.8	3.6	52.8
	%	0.3	1.9	1.9	0.8	2.3
Parks, Conservation Areas, Golf Courses	Acres	1,207.2	1,548.0	1,450.8	6.2	131.1
	%	18.6	11.1	11.3	1.3	5.6
Residential Group Quarters, Nursing Homes	Acres	38.3	147.8	100.8	3.8	9.6
	%	0.6	1.1	0.8	0.8	0.4
Residential Multi-Family	Acres	418.9	1,108.0	966.4	59.7	296.5
	%	6.4	8.0	7.5	12.8	12.7
Residential Mobile Home, or Commercial Parking Lot	Acres	25.6	195.3	150.3	4.9	11.1
	%	0.4	1.4	1.2	1.1	0.5
Residential Single-Family	Acres	2,371.1	4,881.9	4,521.7	70.9	1,201.1
	%	36.5	35.1	35.1	15.2	51.3
Submerged Land (Water Bodies)	Acres	11.1	25.2	29.4	0.2	0.9
	%	0.2	0.2	0.2	0.0	0.0
Transportation, Communication, Rights-Of-Way	Acres	16.7	68.7	69.6	0.0	9.4
	%	0.3	0.5	0.5	0.0	0.4
Utility Plants and Lines, Solid Waste Disposal	Acres	155.4	329.9	357.4	25.6	20.1
	%	2.4	2.4	2.8	5.5	0.9
Vacant	Acres	1,057.6	2,234.9	2,141.7	161.2	195.5
	%	16.3	16.1	16.6	34.6	8.4
Total Acres	**Acres**	**6,503.3**	**13,911.7**	**12,887.1**	**465.3**	**2,339.8**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Department of Community Affairs

Table 6.4 Total Incorporated St. Petersburg Acres in Hazard Areas by Future Land Use Category

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas		Sinkhole Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant
Central Business District	Acres	4.0	0.0	25.0	2.0	23.9	0.4	0.0	0.0	0.0	0.0
	%	0.1	0.0	0.2	0.1	0.2	0.0	0.0	0.0	0.0	0.0
Commercial General	Acres	160.7	19.4	391.9	42.4	295.6	31.0	4.9	2.0	156.7	6.9
	%	2.5	1.8	2.8	1.9	2.3	1.4	1.1	1.2	6.7	3.5
Commercial Recreation	Acres	8.7	0.9	9.8	0.0	11.1	1.3	9.4	1.6	0.0	0.0
	%	0.1	0.1	0.1	0.0	0.1	0.1	2.0	1.0	0.0	0.0
Community Redevelopment District	Acres	44.4	14.7	52.6	15.8	56.2	17.2	0.0	0.0	0.0	0.0
	%	0.7	1.4	0.4	0.7	0.4	0.8	0.0	0.0	0.0	0.0
Industrial	Acres	336.2	56.0	620.4	59.7	575.2	63.1	14.9	0.0	50.6	1.1
	%	5.2	5.3	4.5	2.7	4.5	2.9	3.2	0.0	2.2	0.6
Industrial General	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	101.4	17.4
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	8.9
Industrial Light	Acres	6.9	0.0	977.3	404.4	953.0	381.4	91.6	75.8	0.0	0.0
	%	0.1	0.0	7.0	18.1	7.4	17.8	19.7	47.0	0.0	0.0
No Data	Acres	0.0	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Preservation	Acres	1,317.7	120.6	1,639.0	131.8	1,743.3	149.6	20.7	5.3	122.8	6.5
	%	20.3	11.4	11.8	5.9	13.5	7.0	4.4	3.3	5.2	3.3
Recreation/Open Space	Acres	656.8	141.1	1,495.9	186.8	1,189.3	151.4	82.5	1.8	80.9	2.0
	%	10.1	13.3	10.8	8.4	9.2	7.1	17.7	1.1	3.5	1.0
Residential High	Acres	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Residential Low	Acres	40.6	30.3	40.8	31.9	51.3	32.3	1.3	0.2	0.0	0.0
	%	0.6	2.9	0.3	1.4	0.4	1.5	0.3	0.1	0.0	0.0
Residential Low Medium	Acres	2.9	0.0	12.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Residential Medium	Acres	638.0	346.2	1,431.2	638.9	1,193.3	604.6	17.2	10.3	298.7	87.2
	%	9.8	32.7	10.3	28.6	9.3	28.2	3.7	6.4	12.8	44.6
Residential Rural	Acres	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Residential Urban	Acres	2,741.8	230.3	5,556.3	388.8	5,126.1	356.5	90.3	11.4	1,391.5	61.3
	%	42.2	21.8	39.9	17.4	39.8	16.6	19.4	7.1	59.5	31.4
Residential/Office General	Acres	178.3	50.2	794.7	213.3	771.8	206.4	93.2	39.9	72.7	10.7
	%	2.7	4.7	5.7	9.5	6.0	9.6	20.0	24.8	3.1	5.5
Residential/Office/ Retail	Acres	23.4	2.9	196.0	20.3	237.2	28.3	0.0	0.0	27.9	2.2
	%	0.4	0.3	1.4	0.9	1.8	1.3	0.0	0.0	1.2	1.1
Transportation/Utilities	Acres	249.9	7.6	409.3	32.5	369.6	29.4	31.9	8.5	31.7	0.2
	%	3.8	0.7	2.9	1.5	2.9	1.4	6.9	5.3	1.4	0.1
Water	Acres	90.1	37.5	211.8	59.1	245.7	82.7	2.9	0.7	2.9	0.0
	%	1.4	3.5	1.5	2.6	1.9	3.9	0.6	0.4	0.1	0.0

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas		Sinkhole Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant
Water/Drainage Feature	Acres	2.9	0.0	47.0	6.7	37.0	6.0	4.5	3.8	2.0	0.0
	%	0.0	0.0	0.3	0.3	0.3	0.3	1.0	2.4	0.1	0.0
Total Acres	**Acres**	**6,503.3**	**1,057.6**	**13,911.7**	**2,234.9**	**12,886.9**	**2,141.7**	**465.3**	**161.2**	**2,339.9**	**195.5**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Department of Community Affairs

Municipal Hazard Mitigation Goals and Objectives Related to Comprehensive Planning

The Pinellas County LMS contains a list of "Mitigation Initiatives" that pertain directly to the City of St. Petersburg. Each of these initiatives also references the anticipated cost of the measure. The mitigation initiatives specifically mentioned for the City of St. Petersburg include retrofitting nine fire stations by providing window protection and replacing overhead doors; creation of a Mobile Home Tie-Down Program to provide information about tie-down methods and offer voluntary inspections for the 27 mobile home parks in the City; and retrofitting the Municipal Services Center's windows to protect against storm impacts.

Comprehensive Plan Review

Purpose and Intent

The City of St. Petersburg Comprehensive Plan (adopted March 28, 1989; Amended March 3, 2005) was reviewed for the purpose of developing this profile. This review was undertaken in order to assess what steps St. Petersburg has taken to integrate hazard mitigation initiatives from their Local Mitigation Strategy (LMS) and hazard mitigation initiatives in general, into the local planning process. Each Element of the Plan was evaluated to establish the extent to which the principles from the LMS were incorporated into the objectives and policies of the existing Comprehensive Plan.

Approach

This review includes an assessment of tropical cyclone generated storm surge and flooding hazards. A preliminary list of objectives and policies currently contained in the Plan that pertain to hazard mitigation and any policies related to these hazards is found in **Attachment I**. The following is a discussion of the extent to which the Plan appears to address each of the hazards. Recent policy amendments may not have been available for review, or proposed policies might be in the process of creation, which address these hazards. As a result, this assessment is considered preliminary and subject to input from the local government.

Summary of Findings

The highest risk hazards for St. Petersburg as identified in the County's Local Mitigation Strategy (LMS) are coastal erosion, coastal flooding, and hurricanes and tropical storms. The LMS risk assessment indicated wildfire and sinkholes to be moderate risk hazards for St. Petersburg. Because the City is considered to have low risk to wildfire and and moderate risk to sinkholes, and no policies pertaining to these hazards were found in the City's comprehensive plan, the wildfire and sinkhole hazards are not addressed in this summary.

St. Petersburg is located on the coast, so the bulk of hazard mitigation related policies are geared toward coastal management and resource protection. Emergency management and hazard mitigation policies primarily address hurricane evacuation and storm surge mitigation, flooding, and coastal resource protection. The St. Petersburg Comprehensive Plan focuses on the protection of floodplains, wetlands, and dune systems through land development regulations, and

more specifically, through restrictions on densities and infrastructure in the Coastal High Hazard Area(CHHA).

Storm Surge, Evacuation and Sheltering

The Comprehensive Plan is clear and detailed regarding density restrictions in the CHHA. The City has designated the CHHA as the hurricane evacuation level "A" zone. According to Plan policies, all new proposed developments must consider the hurricane evacuation level and location of the proposed development, and provide appropriate mitigation. Plan policies prohibit the new construction of hospitals, nursing homes, and convalescent homes in Evacuation Level A zones, discourage the siting or expansion of those facilities in Level B zones and limit the expansion of existing sites to the boundaries of the currently developed lot. New mobile home parks are also prohibited within the Evacuation Level A zone, and the expansion of existing sites is limited to the boundaries of the currently developed lot.

The City will review the Tampa Bay Regional Planning Council's (TBRPC) Hurricane Evacuation Study for guidance pertaining to requests for residential density increases in coastal high hazard areas. Policy LU6.1 of the Future Land Use Element states "Requests for residential density increases within the CHHA shall not be approved". The Comprehensive Plan provides mechanisms such as Transfer of Development Rights (TDRs) in order to decrease residential development potentials on remaining vacant tracts in the CHHA.

Policies dictate that the City will adopt land development regulations to provide notice of proposed future land use plan amendments impacting hurricane shelter capacity and evacuation route clearance times to the Tampa Bay Regional Planning Council and Pinellas County Emergency Management Department. The City will also encourage the mitigation, reduction, or elimination of uses that are inconsistent with interagency hazard mitigation report recommendations.

The replacement and expansion of infrastructure and of public facilities in the CHHA is addressed extensively in the Plan. The Coastal Management Element states that expanded infrastructure in the CHHA will only be permitted as necessary to protect public health, welfare and safety, and to service the demand generated by development identified in the Future Land Use Plan. The City will avoid transportation improvements, which encourage or subsidize increased development in the CHHA or environmentally sensitive areas. Policies also limit expenditures on public facilities in the CHHA except for specific purposes, enumerated in the Plan.

Coastal Management Element Subsection 6.6, contains specific "Measures to Maintain or Reduce Evacuation Times": Some of the measures include the prioritization of roadway maintenance and construction projects on identified critical links and major evacuation routes; implementation of the State's Hurricane Preparedness Rule (9J-2.0256) which assesses the public shelter impact of large-scale development; and consideration of early or "phased evacuation", especially for the barrier island communities of St. Petersburg finger-fills. In addition to evacuation policies, there are also numerous policies related to the implementation of Post-Disaster Hazard Mitigation plans.

According to Florida's Statewide Emergency Shelter Plan, Pinellas County had a shelter deficit of 93,527 people in 2004. This shelter deficit includes the vulnerable population in St. Petersburg. The opportunity exists to construct new facilities to standards that will allow them to serve as shelters, and to construct future public facilities outside of floodplain and storm surge areas. The deficit for this County is significant and will need attention as future policies are developed and implemented.

There are several policies aimed at addressing hurricane shelter needs and capacities. Policies tie sheltering needs and capacities directly into the approval of all new proposed developments in the City. The Coastal Management Element requires that any zoning changes in evacuation

levels A, B, or C that would increase residential densities in those areas be evaluated for their impact upon evacuation shelter availability.

All new mobile home parks located outside hurricane surge areas are required to construct and maintain a private shelter which meets minimum Red Cross Evacuation Shelter criteria. Policies dictate that the City will work with Pinellas County local governments, the Red Cross, the School Board and other appropriate agencies to identify solutions to the public shelter deficit in Pinellas County. In addition, the City will assist the Red Cross in identifying more public shelters within St. Petersburg.

Flooding

Flooding is addressed from two vantage points, the protection of natural drainage features, and protection of properties through development standards and stormwater abatement. There are numerous policies directed at minimizing flooding and stormwater runoff, and protecting flood prone areas from potential development impacts.

Policies state that The City of St. Petersburg will implement a Stormwater Management Master Plan and update prioritized municipal drainage improvement projects based on current applicable regulations. The City will coordinate updates of the Master Plan with Pinellas County and neighboring governments in shared drainage basins.

Policy C1.1 of the Conservation Element states that The City will actively enforce minimum building standards identified in the adopted Flood Damage Prevention Ordinance for construction within the 100-year flood plain. The City of St. Petersburg will also comply with or exceed minimum FEMA regulations, in order to reduce the potential for property damage and safety hazards caused by storm flooding. The City will reduce natural hazard impacts through compliance with FEMA regulations and by targeting repetitive flood loss and vulnerable properties for mitigation. The City will maintain an inventory of those repetitive loss properties and target hazard mitigation programs to those properties.

Policies mandate that the City will define and regulate nonconforming and grandfathered land uses consistent with Chapter 163, F.S., with the purpose of reducing or eliminating uses inconsistent with community character. More specifically, these policies are aimed at eliminating repetitive loss and other properties not in compliance with minimum FEMA flood elevation standards as referenced in Coastal Management Policies CM11.11 and CM11.12. Regulations include provisions for eliminating or reducing land uses that are inconsistent with interagency hazard mitigation reports.

Wildfire

Policies directly relating to wildfire hazard were not found during this review.

Sinkhole

Policies directly relating to sinkhole hazard were not found during this review

Summary of Preliminary Recommendations

The City of St. Petersburg's Comprehensive Plan has a good integration of hazard mitigation principles and its LMS has adequate data and goals to support comprehensive planning. However, there are always ways to strengthen such plans, and the following is a summary of options for the City to do so.

Comprehensive Plan Preliminary Recommendations

The following recommendations include hazard mitigation measures in which the City of St. Petersburg can continue to reduce or eliminate risks from storm surge, flood, and sinkholes. These recommendations pertain to the use of vacant lands and/or redevelopment practices. Based on the land use tabulations, most of the vacant acreage is susceptible to flood and tropical cyclone generated storm surge. For more information about the methodology and data used for the land use tabulations, please refer to the "Analysis of Current and Future Vulnerability Based on Land Use" section of the Municipal Case Study in this hazards profile.

Of the vacant lands, 1,058 acres are susceptible to Category 1 storm surge (CHZ), 2,235 acres are susceptible to Category 1 – 3 storm surge (HVZ), 2,142 are susceptible to 100-year flood, 161 acres are susceptible to wildfire, and 196 acres are susceptible to sinkholes. Susceptibility for surge, flood and wildfire are based on risk, whereas susceptibility for sinkhole is based on exposure. Therefore, further analysis is needed to determine the level of risk associated with sinkhole hazards. According to the Pinellas County LMS, the City of St. Petersburg is deemed to have a low risk from wildfire and moderate risk from sinkhole hazards.

Storm Surge

About 71% of the 1,058 vacant acres in the Coastal Hazard Zone and 81% of the 2,235 vacant acres in the Hurricane Vulnerability Zone are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The City should continue limiting development in the CHHA by not approving requests for residential density increases above what is established for Future Land Use Plan designations; considering hurricane evacuation levels and sheltering as part of the approval process for all new proposed development; and considering opportunities to decrease residential development on vacant tracts through plan amendments to less intensive uses, land purchase or transfer of development rights.
- The City should continue to prohibit new or the expansion of existing hospitals, nursing homes, convalescent homes, and mobile home parks; limiting public funds for infrastructure and services; and not accepting operation and maintenance of private roads or facilities in the CHHA.
- The City should continue maintaining or reducing hurricane evacuation clearance time by cooperating with other agencies, coordinating with Pinellas County to evaluate critical links and major evacuation routes for road improvements to reduce delays, identifying more public shelters within St. Petersburg, evaluating zoning changes in the HVZ that would increase residential densities for their impact on shelter availability, and considering "phased evacuation" especially for the barrier island communities, and requiring new mobile home parks to be located outside hurricane surge areas and maintain private shelter.
- The City should continue ensuring that equitable transportation service can accommodate all residents, including special needs for the elderly, disabled, low-income, and other transit dependent persons; and maintaining a list of transportation disadvantaged persons to include in an evacuation.
- The City should continue to increase shelter capacity for all residents, including the homeless.
- The City should continue minimizing disturbance to the natural coastline and protecting vegetative fringe along all shorelines.
- The City should continue prohibiting solid waste and commercial hazardous waste management facilities within the hurricane vulnerability zone.
- The City should continue using strategies in areas that receive major or moderate damage to reduce future damage, such as reducing density and intensity of

development, applying more stringent building codes and construction standards, and acquisition or property.

- The City should continue identifying properties for acquisition after a storm and address relocation, mitigation, or replacement of CHHA infrastructure through post disaster redevelopment planning.
- The City should consider prohibiting septic tanks, and flood-proofing portable water and sanitary sewage facilities in the CHHA
- The City should consider coordinating with Pinellas County to only allow new shelters (including on-site shelters) outside of the HVZ.
- The City should consider denying requests for residential density increases within the CHHA, above what is already included on the Future Land Use Map.
- The Comprehensive Plan should consider a policy to institute a level of service (LOS) standard for evacuation route capacity that is tied to levels of development or population and/or institute an impact fee in the CHHA or HVZ to help pay for additional road capacity, retrofits required for evacuations, and shelter space.

Flood

About 80% of the 2,142 vacant acres in the 100-year floodplain are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The City should continue not locating new or expanded public educational facilities in floodways, not locating community-based residential care facilities in flood-prone areas, and reducing flood damage by exceeding minimum FEMA regulations,
- The City should continue requiring that drainage system alterations and improvements preserve natural drainage characteristics, protecting open green space through the Recreation/Open Space Element, seeking to expand the City's inventory of open space for stormwater percolation, and researching incentives to increase a site's overall pervious surface.
- The City should continue maintaining a list of repetitive loss properties and target hazard mitigation programs to these properties, and bring at least five previously non-compliant structures into compliance each year using elevation or flood-proofing techniques.
- The City should continue to coordinate its Stormwater Master Plan with Pinellas County and neighboring communities in shared drainage basins, and implementing a stormwater utility fee as a dedicated source to fund the Plan.
- The City should continue prioritizing road improvements to evacuation routes that are prone to flooding.
- The City should consider implementing policies for restricting net encroachment of significant wetland resources, prohibiting or minimizing the use of fill to meet minimum flood elevations, and clustering development to increase open space to protect floodplains.
- The City should consider coordinating with Pinellas County to build shelters and essential public facilities outside of the 100-year floodplain.
- The County should consider including a policy for reducing future losses through transfers of development right from areas within the 100-year floodplain to areas outside the 100-year floodplain, or density and intensity limitations in the 100-year floodplain.
- The City should consider including a policy to not approve variances to required flood elevations.
- The City should consider the requirement for the installation of back-flow preventers on new septic tanks in the 100-year floodplain to mitigate impacts from flood, or create incentives and disincentives to reduce the desirability of septic installation within the 100-year floodplain.

- The City should consider requiring that all structures built in the 100-year floodplain include at least 1 foot freeboard. Many post-disaster building performance/damage assessments have shown that it is advisable to include freeboard to reduce future flood damages. Okaloosa and Brevard Counties, City of Jacksonville and the Santa Rosa Island Authority are example communities that have adopted freeboard requirements.
- The City should consider promoting the use of vegetated swales, sodding, landscaping, and retention of natural vegetation as components of the drainage system for natural runoff through the use of landscape and subdivision ordinances.
- The City should consider requiring that developers incorporate wetland portions of sites within the 100-year floodplain as conservation easements.
- The City should consider requiring that the maintenance and operation of private stormwater systems is funded by private sources, if applicable.
- The City should consider requiring areas that have not established base flood elevations to be studied prior to development.
- The City should consider calling for compensating storage calculations in all non coastal flood hazard areas.

Wildfire

Wildfire risk was considered to be very low in the hazards analysis in the latest version of the Pinellas County LMS.

Wildfire hazards could be evaluated further in the next update of the hazards analysis of the LMS to determine the risk. However, based on available data, it appears that wildfire risk is very low.

Sinkhole

About 96% of the 196 vacant acres that are susceptible to sinkhole are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The Comprehensive Plan should consider implementing policies for reducing risk from sinkholes such as publishing available sinkhole data and providing for consideration of sinkhole risk in land suitability analyses through the review process of land development codes, including stormwater management measures.
- The City should consider coordinating with the Southwest Florida Water Management District to provide technical expertise to the public with regard to sinkhole risks.
- The City should consider possibly requiring that new development demonstrate clustered development to achieve open space to protect aquifer recharge, and prohibiting new stormwater management facilities from discharging untreated stormwater runoff into directly-connected sinkholes or the Floridan Aquifer.
- The City should consider the possibility of requiring sub-surface investigations of soil stability in areas suspected of sinkhole activity, per technical advice provided by the Southwest Florida Water Management District and other geo-technical experts.
- The City should consider the possibility of requiring buffers between proposed development and sinkholes, as deemed appropriate.

General

- The City should continue to encourage the mitigation, reduction, or elimination of uses that are inconsistent with any interagency hazard mitigation report that the City deems appropriate.
- The Comprehensive Plan should continue including a policy to consider the effect of hazard mitigation Plan amendments.

- The Comprehensive Plan should continue including a policy for the City to attend Hazard Mitigation Committee meetings toensure that strategies are implemented and updated as necessary.
- Include each hazard layer on the existing and future land use maps to determine where risks are possible to target hazard mitigation strategies.
- The Comprehensive Plan should consider including a policy to incorporate applicable provisions of the Comprehensive Plan into the Comprehensive Emergency Management Plan and the Local Mitigation Strategy.
- Continue educating the public, especially those at high risk from hurricanes, floods, and sinkholes, and make them aware of proactive steps they can take to mitigate damage.

7. Data Sources

County Overview:

Florida Statistical Abstract – 2004 (38th Edition). Bureau of Economic and Business Research, Warrington College of Business, University of Florida. Gainesville, Florida.

State and County QuickFacts. U.S. Census Bureau. Data derived from 2000 Census of Population and Housing.

Hazard Vulnerability:

Florida Repetitive Loss List March 05. Florida Department of Community Affairs, Division of Emergency Management, Flood Mitigation Assistance Office. March 2005.

Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS). Florida Department of Community Affairs, Division of Emergency Management. http://lmsmaps.methaz.org/lmsmaps/

Protecting Florida's Communities – Land Use Planning Strategies and Best Development Practices for Minimizing Vulnerability to Flooding and Coastal Storms. Florida Department of Community Affairs, Division of Community Planning and Division of Emergency Management. September 2004.

State of Florida 2004 Statewide Emergency Shelter Plan. Florida Department of Community Affairs, Division of Emergency Management.

State of Florida. 2005 Hurricane Evacuation Study Database. Florida Department of Community Affairs, Division of Emergency Management.

GIS Data:

Flood Zone
Source: FEMA FIRM GIS coverages (1996), supplied by University of Florida GeoPlan Center Florida Geographic Data Library Version 3.0.

- Areas with an "A_", "V_", "FPQ", "D", "100IC", or "FWIC" value in the "Zone" field in these coverages were considered to be in the 100-year flood zone, and were used in the mapping/analysis.

Hurricane Evacuation Zone/Coastal High-Hazard Area (Category 1 Hurricane Evacuation Zone)
Source: GIS coverage of hurricane zones compiled by Florida Department of Community Affairs/Division of Emergency Management (2003), from GIS data collected from county emergency management agencies in the State of Florida.

- Areas shown/analyzed are those areas in the above-referenced GIS coverage where the value in the field "Evac_cat" is equal to "Zone TS", "Zone A/1", "Zone B/2", or "Zone C/3", in the maps/tables for the Hurricane Vulnerability Zone.
- Areas shown/analyzed are those areas in the above-referenced GIS coverage where the value in the field "Evac_cat" is equal to "Zone TS" or "Zone A/1", in the maps/tables for the Coastal Hazards Zone.

Hurricane Storm Surge Zone GIS Data
Source: GIS coverage of storm surge zones compiled by Florida Department of Community Affairs/Division of Emergency Management (2004), from various storm surge studies performed by regional planning councils and the U.S. Army Corps of Engineers.

- Areas shown/analyzed are those areas in the above-referenced GIS coverage where the value in the field "Category" is equal to "Tropical Storm" or "Category 1".

Sinkhole Hazard GIS Data
Source: Kinetic Analysis Corporation web site (2005),
at: http://lmsmaps.methaz.org/lmsmaps/final_cty/

- Areas shown/analyzed are those areas in the "Rawsink1.shp" GIS coverage supplied by KAC, where the value in the field "Gridcode" is 3 to 6, representing "High", or Very High", "Extremely High", or "Adjacent", based on the classification system used in the sinkhole hazard maps available at the above website.

Wildfire Susceptibility GIS Data
Source: Florida Department of Agriculture and Consumer Services/Division of Forestry, Florida Fire Risk Assessment System (FRAS) data, 2004.

- Areas shown as "wildfire susceptible areas" and that were analyzed are those areas with a "Wildfire Susceptibility Index" value of greater than 10,000 (in north Florida counties) or greater than 0.1 (in south Florida counties)*, based on the FRAS model, and that are also within areas of forest or shrub vegetation or "low impact urban" land cover, based on the Florida Fish and Wildlife Conservation Commission "Florida Vegetation and Land Cover - 2003" GIS data.

    - The rating scale in the "Wildfire Susceptibility Index" GIS coverages has a range of 0 to 100,000 in north Florida counties, and a range of 0 to 1.0 in south Florida counties.

Parks, Conservation Areas, Golf Courses
"Parks, Conservation Areas, Golf Courses" existing land uses include all public and private conservation areas depicted on the statewide GIS coverage of conservation lands "flma_200501.shp", produced by FDEP (2005).

Municipal Boundaries
Source: Boundaries of municipalities were extracted from the U.S. Census 2000 "Places" GIS coverage for the State of Florida.

ATTACHMENT A
Maps of the Existing and Future Land Uses within Coastal Hazards Zone

ATTACHMENT B
Maps of the Existing and Future Land Uses within Hurricane Vulnerability Zone

ATTACHMENT C
Maps of the Existing and Future Land Uses within the 100-year Floodplain

ATTACHMENT D
Maps of the Existing and Future Land Uses within Wildfire Susceptible Areas

ATTACHMENT E
Maps of the Existing and Future Land Uses within the Sinkhole Susceptible Areas

ATTACHMENT F
Local Mitigation Strategy
Goals and Objectives Pertaining to Comprehensive Planning

Pinellas County's LMS includes the following goals and objectives that are directly related to local comprehensive planning and growth management:

GOAL: Increase Public Awareness Regarding Mitigation (Public Education)

- Objective b: Provide education and information to property and business owners about storm damage and ways to properly protect structures.
- Objective c: Raise the awareness of the need for mitigation and develop ways to better educate the public and elected officials.
- Objective e: Provide an ongoing mitigation educational campaign.

GOAL: Create A Disaster Resistant Community (Physical Property and Infrastructure Issues)

- Objective a: Reduce the number of repetitive loss properties.
- Objective b: Review and improve existing land development regulations.
- Objective c: Protect existing public facilities and infrastructure and construct new public facilities and infrastructure to be disaster resistant.
- Objective d: Enhance building codes to reduce structural failures.
- Objective e: Design all new publicly owned buildings as public shelters or for other emergency purposes.
- Objective f: Provide incentives for improving substandard properties and for eliminating non-conforming uses as it applies to hazard mitigation.
- Objective g: Protect the shoreline by natural and man-made systems that are designed to reduce potential damages and erosion.
- Objective h: Limit residential density increases within the coastal high hazard area.
- Objective i: Identify hazardous substances located within the coastal high hazard area and measures taken to minimize the risk of releases.
- Objective j: Retrofit existing schools to public shelter standards and construct all new schools to public shelter standards.
- Objective k: Use mitigation techniques to reduce the economic impacts of natural disasters.

GOAL: Maintain A Program Of Intergovernmental And Interagency Coordination, Cooperation And Partnership To Mitigate Disasters, Evaluate Existing Mitigation Measures, And Propose New Or Modified Mitigation Measures. (Coordination Issues)

- Objective a: Establish frequent coordination among local governments and other groups regarding mitigation issues.
- Objective b: Establish an intergovernmental and interagency group to evaluate the effectiveness of existing mitigation measures after the occurrence of a disaster and propose modifications to existing mitigation measures and/or propose new mitigation measures and strategies.
- Objective c: Develop strategies to have cooperation between the municipalities, the County, the School Board and other public and quasi-public entities within the County to coordinate mitigation efforts.
- Objective d: Develop and coordinate strategies to locate funding mechanisms and financial incentives to promote mitigation efforts.
- Objective e: Develop channels of communication, programs, and partnerships with the business community to promote mitigation efforts.

ATTACHMENT G
Pinellas County Comprehensive Plan Excerpts Pertaining to Hazard Mitigation

From the Pinellas County Comprehensive Plan (as amended through November 15, 2005):

FUTURE LAND USE ELEMENT

OBJECTIVE 1.1: Development intensities shall be compatible with environmental features and with surrounding land uses**,** both developed and undeveloped.

Policy 1.1.8: The Pinellas County Land Development Code may allow a density bonus for affordable housing developments as specified in the County's adopted State Housing Initiatives Partnership Housing Incentive Plan, and subject to program guidelines and specifications as well as compatibility with surrounding development, site constraints, and other appropriate considerations as determined through the Pinellas County Comprehensive Zoning Regulations and the site plan review process. Subject to the above constraints and considerations, any density bonus allowed for an affordable housing development shall not exceed 50 percent of the existing allowable density on a property as determined by the Future Land Use Map or the applicable land development regulations, whichever is more restrictive. A density bonus shall not be allowed for affordable housing developments located within the coastal high hazard area.

Policy 1.1.9: Affordable Housing Developments (AHDs), as defined in the Pinellas County Affordable Housing Incentive Plan (AHIP) and in the Pinellas County Comprehensive Zoning Regulations and certified by the County as an AHD, may be permitted at densities up to 10 units per acre in the Residential/Office/Retail, Residential/Office General, Commercial Neighborhood, and Commercial General land use categories. The permitting of affordable housing developments within these land use categories shall be subject to program guidelines and specifications as well as compatibility with surrounding development, site constraints, and other appropriate considerations as determined through the Pinellas County Comprehensive Zoning Regulations and the site plan review process. Where an affordable housing development occurs as upper stories to underlying development in these land use categories, the allowable floor area permitted for the underlying use is not required to be reduced. Application of this affordable housing incentive shall not be allowed within the coastal high hazard area.

OBJECTIVE 1.2: Pinellas County shall annually review, and amend as necessary, land use and development code provisions which restrain development and redevelopment in areas such as hurricane velocity zones and flood-prone areas to comply with the most recent standards of the National Flood Insurance Program and all other applicable federal and state regulations, including any relevant findings derived from interagency hazard mitigation reports, in order to protect property and the health, safety and welfare of all residents.

Policy 1.2.1: Development or redevelopment in storm impact areas shall be restricted based upon the National Disaster Planning objectives and associated with those objectives shall be consistent with the criteria in Damage Prevention and Flood Plain Management provisions of the Land Development Code.

Policy 1.2.2: The Land Development Code provisions regulating development or redevelopment in flood-prone areas shall be reviewed and amended as necessary based upon the criteria in the National Flood Insurance Program.

Policy 1.2.3: The Local Planning Agency shall review those interagency hazard mitigation report recommendations addressing the elimination or reduction of land uses that are susceptible to damage by natural hazard, and shall recommend to the Board any changes to the Future Land Use Map and/or Plan policies considered critical to reducing, or mitigating, such hazard.

OBJECTIVE 2.1: The Pinellas County Land Development Code shall be applied in a manner that ensures compatibility between the Future Land Use Map, existing environmental conditions and constraints, as well as environmental management goals.

Policy 2.1.3: The natural environment shall be both preserved and enhanced by a sensitive land use program which will include adherence to, but not be limited to, the following chapters of the Land Development Code: Habitat Management and Landscaping; Floodplain Management; Flood Damage Prevention; Site Development and Platting; Comprehensive Zoning Regulations; and any other applicable regulations that deal not only with on-site environmental concerns but also with surrounding land uses.

OBJECTIVE 2.2: Pinellas County shall continue its proactive program for managing the impacts of development upon the County's natural resources (including wetlands, uplands, and the marine environment), and shall continue to ensure that these resources are successfully integrated into the urban environment such that the overall function and viability of these areas is maintained, or where practical, enhanced or restored.

Policy 2.2.1: Significant wetlands and twenty-five year floodplains shall continue to be protected and conserved by their existing designations of Preservation on the Future Land Use Map (FLUM), as adopted by the Board and based upon the comprehensive assessments performed by Pinellas County to evaluate, and subsequently identify, those wetland and floodplain resources with significant value or function.

Policy 2.2.4: Pinellas County shall continue to protect the natural resources of the County through, at a minimum, the application of the Pinellas County Stormwater Management Plan and the Florida State Implementation Plan addressing air quality, as well as enforcement of the Flood Damage Prevention, Flood Plain Management, Habitat Management and Landscape, and the Pinellas County Water and Navigation Control Authority sections of the Land Development Code, and the Future Land Use Map. (Formerly Objective 2.2.)

Policy 2.2.10: Pinellas County shall continue its program of integrated land and water resource planning and management, as exemplified by the commitment to comprehensive watershed studies and the preparation of management plans, by the enforcement of a comprehensive wellhead protection program including land use restrictions, permitting and monitoring criteria, and land acquisition, by ongoing implementation of a multi-faceted water conservation and demand reduction program, by exploring reasonable technologies for water supply, and by the application of Comprehensive Plan policies and land development regulations directed at such things as habitat management and enhancement, promotion of native and drought tolerant plantings, wetland protection, stormwater treatment, and floodplain management.

OBJECTIVE 3.3: Pinellas County Land Development Regulations shall require that the level of population density and development intensity in the coastal planning area shall be compatible with the evacuation capabilities provided for in the hurricane evacuation program.

Policy 3.3.1: In order to limit the exposure of residents and property to coastal hazards and not increase existing and planned demands on hurricane evacuation corridors and public shelters, the population density and development intensity within the coastal planning area shall be consistent with Policies 1.3.2. through 1.3.5. of the Coastal Management Element.

OBJECTIVE 3.8: Pinellas County shall support efforts that facilitate coordination of planning between the County and the School Board for the location and development of public educational facilities.

Policy 3.8.4: In addition to consistency with the Pinellas County Comprehensive Plan, the proposed location of a new or expanded public educational facility of the School Board within one of the land use categories listed in Policy 3.8.2. shall be reviewed and considered with the following general criteria: …7. The proposed location is not in conflict with the County's

Stormwater Management Plan and any watershed management plans adopted by the County, if applicable. 8. The proposed location is not in a velocity flood zone or a floodway.

OBJECTIVE 3.9: Consistent with Chapter 163.3177(6)(a), F.S., and consistent with the County's future land use policies, Pinellas County will explore those opportunities where co-location of public facilities and public schools provides a mutual benefit and represents an efficient use of finances and staff resources. [99-77]

Policy 3.9.1: As the opportunity arises, and in coordination with the Pinellas County School Board, the County will evaluate the ability to co-locate existing or planned school sites with other public facilities, including but not limited to: emergency shelters, bike and pedestrian pathways, libraries, parks, and community and recreational centers and facilities. [99-77]

TRANSPORTATION ELEMENT

OBJECTIVE 1.8: Pinellas County shall increase the efficiency and effectiveness of mass transit service as well as opportunities for multi-passenger vehicle travel, that accommodates the transportation needs of the service area population and the transportation disadvantaged while reducing single-occupant vehicle demand. Regarding mass transit, this objective shall be furthered through the amendment of the Comprehensive Plan in 2000 to incorporate and implement recommendations of the MPO-sponsored Pinellas Mobility Major Investment Study (MIS).

Policy 1.8.8: Within one year following the adoption of the Transportation Element, in cooperation with the MPO, Pinellas County shall develop an inventory of transportation disadvantaged persons that would be affected by an evacuation order in the event of a natural disaster. Those needing to evacuate to a public shelter who have no personal means available to transport them, shall be provided the opportunity to register with Pinellas County for Special Needs assistance in order to receive transportation assistance.

OBJECTIVE 1.9: Pinellas County's transportation system should provide for safety and efficiency in the movement of people and goods.

Policy 1.9.6: Pinellas County shall ensure the availability of adequate transportation facilities for the safe and timely evacuation of high risk areas to prevent loss of life due to natural disasters consistent with the Hurricane Evacuation Plan. Following the completion of the Tampa Bay Regional Council's hurricane evacuation study of the Tampa Bay Region, which is scheduled to occur in 1998, Pinellas County shall utilize the study information to assess the adequacy of its transportation system to provide for the evacuation needs of the public. The results of this assessment shall be incorporated as an amendment to the Comprehensive Plan by 1999.

NATURAL, HISTORIC AND CULTURAL RESOURCES ELEMENT

OBJECTIVE 1.1: Information on areas with high sinkhole / subsidence susceptibility shall be made available for use in County planning and private land development.

Policy 1.1.1.: By January 1, 1998, Pinellas County shall publicize the availability of information on areas with high sinkhole / subsidence susceptibility at County offices.

OBJECTIVE 1.2: Coastal geologic features shall provide both public enjoyment and natural functions.

Policy 1.2.1: In conjunction with other policies found in the Coastal Management Element, beach nourishment projects shall be designed to include dune restoration.

Policy 1.2.3: County owned beach front property shall be managed to provide for public access, public facilities, and the preservation or enhancement of natural functions.

OBJECTIVE 7.1: Pinellas County shall continue to protect floodplains, flood ways, and all other natural areas having functional hydrological characteristics.

Policy 7.1.1: All construction in floodplains and flood ways shall be required to comply with Federal Emergency Management Agency or Federal Insurance Administration standards and county building codes.

Policy 7.1.2: Developers shall be required, through the site plan review process, to incorporate those wetland portions of sites which are within 100-year floodplains as conservation easements.

Policy 7.1.3: Construction in floodplains shall continue to be limited by the enforcement of Section 158, the Pinellas County Floodplain Management portion of the Land Development Code, as amended.

Policy 7.1.4: Pinellas County shall not approve any request to increase residential density above 5.0 u.p.a. on the Future Land Use Element for areas within l00 year floodplains.

Policy 7.1.5: Wetlands and floodplains shall continue to be preserved through such means as a preservation designation on the Future Land Use Map, and shall be protected as conveyance systems, as well as wildlife and vegetative habitat.

Policy 7.1.6: The County shall enforce its erosion control regulations to reduce sedimentation in floodplains resulting from upland development activities.

Policy 7.1.7: The County shall encourage alternatives to the hardening and bulkheading of natural banks, natural stream courses, and creeks through the enforcement of appropriate ordinances.

OBJECTIVE 7.2: Pinellas County shall continue to maintain, and enhance where possible, the current balance of living resources in the floodplains of the County.

Policy 7.2.1: The County shall continue to prohibit dredging and filling or other development activities having significant long-term impacts on the ecological or hydrological function of the floodplains, except in cases clearly in the public interest.

COASTAL MANAGEMENT ELEMENT

NATURAL DISASTER PLANNING

OBJECTIVE 1.1: Pinellas County shall continue to implement its Post-Disaster Redevelopment Plan as part of the Pinellas County Comprehensive Emergency Management Plan, and shall continue to implement hazard mitigation measures to reduce the exposure of human life and public and private property to natural hazards.

Policy 1.1.1: The Redevelopment Plan shall distinguish between the immediate emergency period actions needed to protect the public health and safety and long-range restoration activities.

Policy 1.1.2: The Redevelopment Plan shall establish who will be responsible for making crucial decisions after a natural disaster regarding repair, reconstruction, relocation and hazard mitigation; this body could take the form of a recovery task force.

Policy 1.1.3: The Redevelopment Plan shall establish procedures for the restoration of essential public services and facilities following a disaster.

Policy 1.1.4: The Redevelopment Plan shall establish procedures for evaluating the effectiveness of current hazard mitigation measures at preventing damage.

Policy 1.1.5: The Redevelopment Plan shall establish procedures for utilizing information obtained from damage assessment teams in expediting post-disaster recovery.

Policy 1.1.6: The Redevelopment Plan shall contain provisions for enactment of a temporary restriction on issuing permits for reconstruction and repair not immediately needed to protect the public health, safety and welfare.

Policy 1.1.7: The Redevelopment Plan shall establish criteria for evaluating the options for repairing, replacing, modifying or relocating public and private facilities and infrastructure within coastal high-hazard areas. Any actions chosen by Pinellas County to repair, replace, modify, or relocate public facilities and infrastructure within the coastal high hazard area shall be consistent with federal and state funding standards.

Policy 1.1.8: The Redevelopment Plan shall establish that structures damaged by fire or natural forces to the extent that the cost of reconstruction or repair exceeds 50 percent of the market value of the structure before the damage occurred shall be rebuilt to meet all applicable federal, state and local regulations.

Policy 1.1.9: The Redevelopment Plan shall include guidelines and criteria for determining priorities for the acquisition of storm-damaged property in the coastal high-hazard area. These guidelines shall give priority to eliminating unsafe conditions and inappropriate uses. These guidelines/criteria will also be used to prioritize potential coastal acquisitions through the State's land acquisition program. By January 31, 1998, additional criteria will be developed and included within the redevelopment plan to recognize pristine coastal properties or properties of significant or important environmental sensitivity.

Policy 1.1.10: Pinellas County shall continue to implement its existing hazard mitigation programs that include shoreline restoration and enhancement, building code and floodplain regulations, development management techniques such as land use, zoning, and subdivision regulations, and other applicable hazard mitigation measures. Recommendations from interagency hazard mitigation reports may be incorporated, at the discretion of the County. These mitigation programs shall be amended, as necessary, to remain consistent with federal and state requirements.

Policy 1.1.11: Pinellas County will use its Comprehensive Plan, its Land Development Code, and other applicable hazard mitigation measures, including appropriate recommendations from interagency hazard mitigation reports, to reduce unsafe conditions and inappropriate uses as opportunities arise, and to limit redevelopment in areas of repeated damage.

Policy 1.1.12: Pinellas County shall re-visit both its Post Disaster Redevelopment Plan and its Comprehensive Plan within six months of completion of the Local Mitigation Strategy in order to determine if any amendments or revisions are required in order to facilitate implementation of the final strategies.

OBJECTIVE 1.2: Pinellas County shall cooperate with state and regional agencies, and with other local governments to maintain or reduce hurricane clearance times as a component of the evacuation times for Pinellas County.

Policy 1.2.1: Pursuant to the Capital Improvements Element, Pinellas County shall annually evaluate projects proposed for inclusion within the Six-Year Schedule of Improvements and shall place a high priority on improvement needs for critical links and evacuation route points, and for bridges, causeways and highway facilities designated as regional evacuation routes when scheduling capital improvement projects.

Policy 1.2.2: The Board shall continue to enforce its regulations requiring the development of a hurricane evacuation plan by recreational vehicle parks and transient accommodations.

1.2.3 Policy: The County shall coordinate with the Florida Department of Transportation during preparation of the Transportation Improvement Plan for District 7 in order to encourage the State to give priority to road improvement projects on regional hurricane evacuation routes.

Policy 1.2.4: The County shall utilize the existing countywide computerized traffic signalization system and available law enforcement officers to expedite hurricane evacuation.

Policy 1.2.5: The County shall continue its public awareness campaign in cooperation with the Tampa Bay Regional Planning Agency to educate the general public on proper hurricane evacuation procedures. As part of the County's public awareness campaign, the County shall also publish and make available a hurricane preparedness handbook to the general public prior to June 1 of each year.

Policy 1.2.6: Pinellas County shall cooperate with the State Division of Emergency Management to coordinate multi-county evacuations in a manner consistent with the Pinellas County Hurricane Evacuation Implementation Guide.

Policy 1.2.7: County-maintained roadways used as evacuation routes shall continue to be clearly posted.

Policy 1.2.8: Hurricane evacuation shall be planned and conducted in a manner consistent with the Pinellas County Comprehensive Emergency Management Plan.

OBJECTIVE 1.3: Pinellas County shall restrict development within the coastal high hazard area, and shall direct population concentrations out of the coastal high-hazard area.

Policy 1.3.1: The coastal high-hazard area (CHHA) shall be the Evacuation Level A areas identified in the most recent regional hurricane evacuation study.

Policy 1.3.2: Pinellas County shall prohibit the location of new, or expansion of existing hospitals, nursing homes, and assisted living facilities within the coastal high-hazard area. The County shall discourage the siting of these facilities within the Evacuation Level B area.

Policy 1.3.3: Pinellas County shall not approve any request for residential density above 5.0 units per gross acre on the Future Land Use Element for areas within the coastal high-hazard area.[99-24]
Policy 1.3.4: Pinellas County shall prohibit the siting of new or the expansion of existing mobile home development within the coastal high-hazard area.

Policy 1.3.5: On an annual basis, the County's existing hazard mitigation programs, including those within the Land Development Code, shall be reviewed and revised if necessary to reduce the vulnerability of future development in coastal high-hazard areas. This review shall evaluate the recommendations of existing interagency hazard mitigation reports and the mitigation functions chapter of the Pinellas County Comprehensive Emergency Management Plan.

Policy 1.3.6: Consistent with the goals, objectives and policies of this Element and the availability of budgeted funds, the County shall evaluate the acquisition of storm-damaged property in the coastal high-hazard area.

Policy 1.3.7: By December 31, 1998, Pinellas County shall evaluate the feasibility of limiting the capacity of hospitals, nursing homes, and assisted living facilities proposed to be located within the Evacuation Level B area, as identified within the most recent regional evacuation study.

OBJECTIVE 1.4: Pinellas County shall restrict public expenditures that subsidize development in the coastal high-hazard area.

Policy 1.4.1: County-funded infrastructure shall be prohibited within the coastal high-hazard area except for the following: The expenditure for the maintenance, repair or replacement of existing facilities; or The expenditure for restoration or enhancement of natural resources or public access; or The expenditure needed to address an existing deficiency identified in this plan; or The expenditure for the retrofitting of stormwater management facilities for water quality enhancement of stormwater runoff; or The expenditure for the development or improvement of public roads and bridges identified in the Transportation Element of this plan; or the expenditure for a public facility of overriding public interest to ensure public health and safety.

Policy 1.4.2: When public infrastructure within the coastal high-hazard area is destroyed or receives damage that equals or exceeds 50 percent of the cost of replacing the facility at its current location, the County shall analyze the feasibility of relocating this infrastructure landward of the coastal high-hazard area. This requirement is included within the Pinellas County Post-Disaster Redevelopment Plan as adopted within the Pinellas County Comprehensive Emergency Management Plan.

Policy 1.4.3: Pinellas County shall not construct bridges or causeways to barrier islands not serviced by such infrastructure at the time of Plan adoption.

OBJECTIVE 1.5: By December 31, 2000, the existing deficit of public shelter spaces within the County shall be reduced by five percent.

Policy 1.5.1: The County shall assist the Pinellas County Red Cross in coordinating with local jurisdictions and appropriate agencies in the development of a countywide plan for increasing the number of public shelter spaces in Pinellas County.

Policy 1.5.2: Pinellas County shall expand its coordination efforts within the limits provided by legislative authority to coordinate facility expansion plans and development review with the Pinellas County School Board so that new school facilities and facility expansion will be located and designed to provide hurricane shelters.

Policy 1.5.3: If the County determines, during its review of a proposed public school site for consistency with the Pinellas County Comprehensive Plan and after consideration of the criteria in Section 235.26(9) of the Florida Statutes, that the site is an appropriate location for a shelter, the final determination of consistency will include a recommendation that the public school be constructed to function as a public emergency shelter.

Policy 1.5.4: Whenever possible, new or expanded county buildings shall be located, designed, and constructed so that they may be utilized for hurricane shelters.

Policy 1.5.5: Alternatives to traditional public sheltering shall be developed and promoted through public education by Pinellas County and other appropriate agencies. Alternatives to traditional public sheltering shall include, but not necessarily be limited to, host home programs, inland sheltering, retrofitting of existing structures whenever possible, utilizing refuges of last resort as appropriate, and evacuation of guests from transient accommodations to inland “sister” transient accommodations.

Policy 1.5.6: Pinellas County shall initiate discussion of new cooperative efforts between the County, municipalities, the Pinellas County School Board, and other appropriate agencies in an attempt to increase the number of public shelters and to reduce the shelter deficit.

Policy 1.5.7: Pinellas County shall utilize its public education program to attempt to decrease the number of Pinellas County residents that unnecessarily seek shelter during hurricane evacuations.

Policy 1.5.8: As a means of identifying solutions to the existing public shelter deficit, Pinellas County shall host an emergency shelter workshop, or summit, for affected governments and agencies by December 31, 1998.

Policy 1.5.9: Pinellas County shall participate with the State Division of Emergency Management in their development of a regional Hurricane Evacuation Plan, and, within a year of its completion, shall have evaluated any relevant recommendations, including those regarding shelter capacity, for inclusion in the Comprehensive Plan.

BEACH AND DUNE SYSTEMS

OBJECTIVE 2.1: Pinellas County shall continue implementation of the Pinellas County Beach Enhancement Five-Year Program, to restore altered beaches and dunes, and shall annually update the program.

Policy 2.1.1: Pinellas County shall continue a program for restoring and renourishing sandy beaches and dunes.

Policy 2.1.2: Pinellas County shall continue the role as the lead agency for coordinating and managing beach restoration/renourishment projects.

Policy 2.1.3: Pinellas County shall monitor erosion of the County's renourished beaches and shall develop alternative strategies for beach enhancement based on the results of the monitoring program.

OBJECTIVE 2.2: Pinellas County shall continue to protect the stability of the dune systems and the beach itself by utilizing construction standards, development regulations and other appropriate measures that minimize the impacts of man on the beach and dune systems.

Policy 2.2.1: New development shall be prohibited in the frontal dune and beach area.

Policy 2.2.2: Vehicle and foot traffic over the frontal dune systems shall be restricted by providing vehicular parking and dune walkovers.

Policy 2.2.3: The County shall continue to implement County and State regulations pertaining to construction seaward of the State Coastal Construction Control Line.

Policy 2.2.4: Pinellas County shall designate undeveloped coastal barrier islands as Preservation, Recreation/Open Space or Preservation-Resource Management on the Future Land Use Map.

OBJECTIVE 3.1: Public access to the beaches and shorelines of Pinellas County shall be increased through acquisition, development, and expansion of facilities.

Policy 3.1.6: Pinellas County shall utilize the guidelines in the Pinellas County Post Disaster Redevelopment Plan to prioritize potential coastal acquisitions through the State's land acquisition program. Additional criteria will be developed and included in the Post Disaster Redevelopment Plan by January 31, 1998 to recognize pristine coastal properties or properties of significant or important environmental sensitivity.

OBJECTIVE 4.1: The County shall give priority to water-dependent and water-related land uses in the coastal planning area, in a manner consistent with its goals for the protection of coastal and marine habitats and species. [03-33]

Policy 4.1.5: No marina project shall be approved until a hurricane plan for this project has been established. [03-33]

OBJECTIVE 5.1: Pinellas County shall continue to ensure that adequate level**s** of service are provided by public facilities within the coastal planning area, and shall utilize the annual update of the Capital Improvements Element to schedule required infrastructure improvements in the coastal planning area.

Policy 5.1.1: The level of service standards adopted elsewhere for public facilities in the Pinellas County Comprehensive Plan shall be the same standards used for public facilities within the coastal planning area.

Policy 5.1.2: The scheduling of public facility improvements within the coastal planning area shall be consistent with the Capital Improvements Element of this Plan.

Policy 5.1.3: The service areas for public facilities within the coastal planning area shall be those identified and/or established elsewhere in this Plan.

Policy 5.1.4: Pinellas County shall ensure that required infrastructure is available to serve development or redevelopment in the coastal planning area, when such development is consistent with the densities proposed by the Future Land Use Map as well as with coastal resource protection and public safety policies, by assuring that funding for such infrastructure is phased to coincide with demand.

HOUSING ELEMENT

OBJECTIVE 1.5: Provide incentives and encourage provision of housing affordable to Very Low, Low, and Moderate Income households, including households with special needs, through public, private and joint ventures so that 4,708 housing units are made available for growth in these income categories through 2010.

Policy 1.5.16: Affordable Housing Developments (AHDs), as defined in the Pinellas County Affordable Housing Incentive Plan (AHIP) and in the Pinellas County Comprehensive Zoning Regulations and certified by the County as an AHD, may be permitted at densities up to 10 units per acre in the Residential/Office/Retail, Residential/Office General, Commercial Neighborhood and Commercial General land use categories. The permitting of affordable housing developments within these land use categories shall be subject to program guidelines and specifications as well as compatibility with surrounding development, site constraints, and other appropriate considerations as determined through the Pinellas County Comprehensive Zoning Regulations and the site plan review process. Where an affordable housing development occurs as upper stories to underlying development in these land use categories, the allowable floor area permitted for the underlying use is not required to be reduced. Application of this affordable housing incentive shall not be allowed within the coastal high hazard area or the Evacuation Level A area.

Policy 1.5.8: The Pinellas County land development regulations may allow a density bonus for affordable housing developments as specified in the County's adopted Affordable Housing Incentive Plan, and subject to program guidelines and specifications as well as compatibility with surrounding development, site constraints, and other appropriate consideration as determined through the Pinellas County Comprehensive Zoning Regulations and the site plan review process. Subject to the above constraints and considerations, any density bonus allowed for an affordable housing development shall not exceed 50 percent of the existing allowable density on a property as determined by the Future Land Use Map or the applicable land development regulations, whichever is more restrictive. A density bonus shall not be allowed for affordable housing developments located within the coastal high hazard area or the Evacuation Level A area.

Policy 1.5.16: Affordable Housing Developments (AHDs), as defined in the Pinellas County Affordable Housing Incentive Plan (AHIP) and in the Pinellas County Comprehensive Zoning Regulations and certified by the County as an AHD, may be permitted at densities up to 10 units per acre in the Residential/Office/Retail, Residential/Office General, Commercial Neighborhood

and Commercial General land use categories. The permitting of affordable housing developments within these land use categories shall be subject to program guidelines and specifications as well as compatibility with surrounding development, site constraints, and other appropriate considerations as determined through the Pinellas County Comprehensive Zoning Regulations and the site plan review process. Where an affordable housing development occurs as upper stories to underlying development in these land use categories, the allowable floor area permitted for the underlying use is not required to be reduced. Application of this affordable housing incentive shall not be allowed within the coastal high hazard area or the Evacuation Level A area.

OBJECTIVE 1.7: Provide for adequate sites in residential areas or areas of residential character for group homes and foster care facilities licensed by HRS.

Policy 1.7.1: The County shall continue to allow for licensed group homes and foster care facilities in all residential districts, and shall encourage their location where there is adequate supporting infrastructure and medical and public facilities; provided that they are not located within a specified distance of a similar facility, hurricane vulnerable areas, coastal high-hazard areas and areas where potential for flooding exists. [99-24]

INTERGOVERNMENTAL COORDINATION ELEMENT

OBJECTIVE 1.10: The County supports the concept of cooperative and regional solutions to disaster planning and, in particular, to resolution of the existing emergency shelter deficit.

Policy 1.10.1: By December of 1998, the County will coordinate and/or co-sponsor a regional workshop/summit directed at identifying coordinated regional solutions to the existing emergency shelter deficit.

RECREATION AND OPEN SPACE ELEMENT

OBJECTIVE 1.8: By December 1998, the County shall have established a process for identifying and prioritizing coastal properties within the County for acquisition, consistent with the State's land acquisition program. [00-97]

Policy 1.8.1: The County's process for identifying and prioritizing coastal properties for acquisition shall consider, at a minimum, the following criteria:

- degree of environmental significance and pristine condition;
- consistency with hazard mitigation requirements;
- beach access and management opportunities; and
- urban park and open space needs. [00-97]

SANITARY SEWER ELEMENT

OBJECTIVE 1.2: Wastewater Treatment facilities and their operation shall be protected from natural disasters.

Policy 1.2.2: The future siting of wastewater treatment plants shall not occur within the Coastal High Hazard Area. [99-24]

SURFACE WATER MANAGEMENT ELEMENT

OBJECTIVE 1.1: All major stormwater deficiencies identified in the Stormwater Management Plan as the responsibility of the Pinellas County Board of County Commissioners (BCC) shall be corrected by the year 2010.

Policy 1.1.1: Existing deficiencies, as identified in the Stormwater Management Plan**,** shall be the first priority for stormwater project implementation.

Policy 1.1.2: The implementation of stormwater projects designed to accommodate future growth shall be the second priority.

OBJECTIVE 1.2: The County shall apply the following level of service standards to support the goal of the Surface Water Management Element regarding stormwater management.

Policy 1.2.1: All applicable federal, state, and local regulations (as indicated in the Regulatory Framework section of the Surface Water Management Element) relating to flood control, stormwater treatment and wetland protection shall continue to be met in public and private project design.

Policy 1.2.2: The twenty-five year storm design standard shall confine the runoff from a twenty-five year 6 hour rainfall event, or a 25 year, 24 hour rainfall event, whichever is more severe, within drainage channel banks, or within designated twenty-five year floodplains, in order to protect human life and minimize property damage.

Policy 1.2.3: The one-hundred year storm design standard shall protect homes and commercial buildings against flooding by a 100 year 24 hour rainfall event.

Policy 1.2.4: To accomplish Policy 1.2.2. preference shall be given to management options which restore floodplains and remove obstructions from floodways.

OBJECTIVE 1.3: Stormwater management and resource protection and management objectives shall be mutually supportive.

Policy 1.3.1: Pinellas County shall enforce County stormwater regulations requiring new construction, or redeveloped sites other than individual single family areas, to meet the current applicable stormwater management standards (consistent with the Regulatory Framework section of the Surface Water Management Element).

Policy 1.3.4: The County shall permit the use of isolated wetlands for stormwater attenuation, when not in conflict with environmental or public use considerations.

Policy 1.3.5: Pinellas County Stormwater Management Plan projects within the Tampa Bay watershed shall support, and further, the goals of the Comprehensive Conservation and Management Plan (CCMP) for Tampa Bay.

Policy 1.3.6: Those stormwater management project designs which retain water within the impacted watershed, by means of wetland storage or groundwater infiltration, shall be preferred over those which encourage rapid discharge, particularly outside of the watershed.

OBJECTIVE 1.4: Pinellas County shall show measurable improvement**s** in the quality of County waters, and their associated habitats, as a result of management activities.

Policy 1.4.1: In implementation of, or revision to, the Pinellas County Stormwater Management Plan, the County shall support the use of natural alternatives, the conservation and restoration of natural drainage systems, and the protection and improvement of the quality of receiving waters and their living resources.

Policy 1.4.8: Where basin or waterbody specific management plans indicate that stricter, or basin-specific stormwater regulations are essential, regulations shall be redrafted and resubmitted to the Board of County Commissioners.

Policy 1.4.9: Stormwater management projects as well as ongoing operations and maintenance activities shall be carried out consistent with adopted watershed/ waterbody management plans.

Policy 1.4.10: In watersheds or waterbodies where a watershed or waterbody management plan has not yet been completed, stormwater management projects shall be designed to be consistent with the policies of the Surface Water Management Element, the Natural, Historic and Cultural Resources Element, and Coastal Management Element of the Comprehensive Plan.

Policy 1.4.11: Each stormwater management project design shall include an evaluation of the feasibility of, and give preference to, natural versus structural alternatives, or a combination thereof.

Policy 1.4.12: During development and redevelopment, the site plan process shall ensure that the benefits of natural drainageways and natural storage areas shall be retained or restored where feasible.

Policy 1.4.13: Wetlands and floodplains shall continue to be preserved (e.g., designated as Preservation on the Future Land Use Plan) and protected as conveyance systems, as wildlife and vegetative habitat, and as natural storage.

Policy 1.4.18: Erosion control regulations shall continue to be enforced to control sedimentation, to assure the continued efficient operation of the drainage system and to protect streams, lakes, bays, and other water bodies and natural resources from substantial alteration of their natural functions.

OBJECTIVE 1.10: Pinellas County shall continue to implement local stormwater projects in the unincorporated County which are outside of the scope of the Pinellas County Stormwater Management Plan.

Policy 1.10.1: In the implementation of local stormwater management projects, all applicable federal, state, and local regulations (as indicated in the Regulatory Framework section of the Surface Water Management Element) shall continue to be required in both public and private project design, implementation and operation

Policy 1.10.2: As local stormwater management needs are documented, the County shall prioritize and implement improvements in accordance with the capital improvements schedule.

CAPITAL IMPROVEMENTS ELEMENT

OBJECTIVE 1.2: Public expenditures that subsidize development in the coastal high hazard area shall be limited to those improvements that are consistent with applicable goals, objectives, and policies in the Coastal Management, Future Land Use, Surface Water Management, and Natural, Historic and Cultural Resources Elements of the Pinellas County Comprehensive Plan.

Policy 1.2.1: County-funded infrastructure shall be prohibited within the coastal high hazard area except for the following: 1. the expenditure is for the maintenance, repair or replacement of existing facilities; or 2. the expenditure is for restoration or enhancement of natural resources or public access; or; 3. the expenditure is needed to address an existing deficiency identified in this plan; or 4. the expenditure is for the retrofitting of stormwater management facilities for water quality enhancement of stormwater runoff; or 5. the expenditure is for the development or improvement of public roads and bridges identified in the Transportation Element of this plan; or 6. the expenditure is for a public facility of overriding public interest as determined by the Board of County Commissioners.

ATTACHMENT H
City of Madeira Beach Comprehensive Plan Excerpts Related to Hazard Mitigation

From the Madeira Beach Comprehensive Plan (adopted September 5, 1999):

FUTURE LAND USE ELEMENT

OBJECTIVE 1.2: LAND DEVELOPMENT REGULATIONS. Future growth and development shall be managed through the implementation and enforcement of the land development regulations as codified in *Chapter 20, Code of Ordinances* of the City of Madeira Beach consistent with this comprehensive plan.

Policy 1.2.1: The land development regulations shall contain administrative provisions:

- For the subdivision of land, the use of land, the protection of environmentally sensitive lands, and flood hazard safety;
- Which implement guidelines for the administration of those land use categories adopted for the City of Madeira Beach; Ensuring that applications for development approval are subject to site plan review, except for single-family, duplex, and triplex dwelling units;
- Ensuring that all development is consistent with those coastal construction regulations adopted and/or amended by the State of Florida, Pinellas County, and other agencies with jurisdictional responsibilities;
- Ensuring that drainage and stormwater management is based on the minimum criteria established by the Southwest Florida Water Management District and other governmental agencies with jurisdictional responsibilities; and
- Ensuring that all development is consistent with National Flood Insurance Program regulations.

Policy 1.2.2: The land development regulations shall contain design provisions:

- Ensuring compliance with the stormwater requirements of the Southwest Florida Water Management District, for the permitted use of either vegetated swales in conjunction with retention ponds or sand filtration and catchment systems where space prohibits the use of retention ponds;
- For drainage and stormwater management, open space, safe and convenient on-site traffic flow, parking, and signage;
- Ensuring the compatibility of adjacent land uses and provide for adequate and appropriate buffering;
- Encouraging the use of native vegetation in the landscaping of multifamily and commercial developments;
- Designed to direct water flows along natural drainage courses and through natural terrain;
- To provide that new development stormwater runoff is routed to protect neighboring property and minimize ecological damage. Compliance with this requirement shall be demonstrated by the developer during site plan review; and

Policy 1.2.3: The land development regulations shall contain stormwater management provisions:

- Ensuring that surface cover vegetation loss during construction is minimized and/or replaced to reduce erosion and flooding;
- To provide that the developer/owner of any new development or redevelopment site is responsible for the on-site management of stormwater runoff in a manner so that post-

development runoff rates, volumes, and pollutant loads are minimized and not exceed predevelopment conditions;

- To provide that impervious surfaces are minimized;
- To provide that future drainage outfalls associated with either new development or redevelopment, shall be designed so as to prevent, to the extent practicable, the direct discharge of runoff into the Intracoastal Waterway or the Gulf of Mexico; and
- To provide that roadways, pipe systems, and stormwater sewers are designed to avoid the alteration of vital habitat areas and minimize interference with the surface water or groundwater flow.

Policy 1.2.5: The land development regulations shall recognize the limitations of development on a barrier island resulting from the effects of the Coastal High Hazard Area, 100-year floodplain, vulnerability to tropical storms, topography, and soil conditions.

OBJECTIVE 1.5: RESIDENTIAL DEVELOPMENT. The integrity and quality of life, as exhibited by the continuation of the city's nautical, beach community, family-oriented, residential character, will be maintained in residential neighborhoods

Policy 1.5.5: The land development regulations shall contain provisions whereby residential land uses are located and designed to protect life and property from natural and manmade hazards such as flooding, excessive traffic, subsidence, noxious odors, noise, and deterioration of structures.

OBJECTIVE 1.10: NATURAL RESOURCES. Redevelopment activities shall ensure the protection of natural resources.

Policy 1.10.7: The land development regulations shall contain provisions that protect coastal vegetative communities, coastal wildlife habitats, and dune systems from the adverse effects of development.

OBJECTIVE 1.15: HURRICANE EVACUATION PLAN. The City, in cooperation with the Pinellas County Department of Emergency Management, the Town of Redington Beach, the City of Seminole, and Pinellas County shall implement the adopted *Hurricane Evacuation Plan.*

INFRASTRUCTURE

OBJECTIVE 4.1: CONFORMANCE WITH APPLICABLE REGULATIONS. All applicable federal, state, and local regulations relating to flood control and water quality shall continue to be met in public and private design and construction.

Policy 4.1.1: All new development, excluding single-family homes, duplexes, or triplexes, shall adhere to stormwater management requirements as listed within this element.

Policy 4.1.2: All redevelopment shall adhere to the stormwater management requirements as listed within this element, excluding:

- Minor additions, alterations, or improvements which do not increase existing gross floor area by more than 5 percent or vehicular use areas by more than 10 percent; and
- Alterations and repairs, the aggregate cost of which does not exceed 25 percent of fair market value of the structure.

OBJECTIVE 4.2: STORMWATER LEVEL-OF-SERVICE STANDARDS. The City shall ensure that adopted level-of-service standards for flood control are maintained.

Policy 4.2.1: The adopted level of service for drainage shall be the 10-year frequency, 60-minute storm event and city land development regulations shall contain provisions which ensure that all stormwater management systems shall be designed to meet or exceed that standard.

Policy 4.2.2: The land development regulations shall contain provisions which, at a minimum, protect natural drainage features found within the city as follows:

- The flood-carrying and flood storage capacity of the 100-year floodplain shall be maintained;
- Development along Boca Ciega Bay shall maintain adequate setbacks to maintain any existing areas of natural coastal/marine habitat;
- The prevention of erosion, retardation of runoff and protection of natural functions and values of the floodplain shall be considered while promoting public usage; and
- Development or redevelopment proposals shall be consistent with the performance standards regulating development within the designated floodplain.

Policy 4.2.4: The City shall require that the discharge rate for a post-developed or redeveloped site shall not exceed, in terms of peak flow and total volume, that which would have occurred under pre-development conditions.

OBJECTIVE 4.4: STORMWATER MANAGEMENT PLAN. The City shall pursue developing a stormwater management plan to address drainage and existing flooding conditions.

Policy 4.4.1: The following management techniques may be used for the interim stormwater management plan:

- No more than 70 percent of any parcel or lot shall be covered by impervious surface;
- Regular maintenance of retention swales adjacent to city roadways;
- Use of front, rear, and side lot line swales in new development;
- Use of erosion and runoff control devices during construction;
- Where necessary, the City shall consider construction of drainage retention areas in the public right-of-way and the use of eminent domain condemnation to acquire property for drainage retention purposes; and
- Where existing waterways are not sea-walled native marine vegetation shall be used for shoreline stabilization where technically feasible.

Policy 4.4.2: The master stormwater management plan shall at a minimum address the following:

- An inventory and evaluation of those areas which currently have flooding problems;
- A hydrological survey showing natural and man-made systems;
- A water quality analysis of stormwater runoff and its impact on receiving water bodies and groundwater; and
- A list of recommended corrective measures and the projected implementation cost.

OBJECTIVE 4.5: IMPLEMENTATION OF THE MASTER STORMWATER MANAGEMENT PLAN. Following the completion of the master stormwater management plan, the City shall take positive steps to implement the plan.

Policy 4.5.1: The City shall require new development to adhere to the master stormwater management plan.

Policy 4.5.2: Consistent with budget allocations, the City shall establish a program for retrofitting of the system's existing deficiencies to conform to the master stormwater management plan.

Policy 4.5.3: The following existing deficiencies are considered top priority within the stormwater management improvement program. 140th Avenue, one block east of Gulf Boulevard; 142nd Avenue at North Bayshore; Pruitt Drive; Bay Point Drive; Boca Ciega Avenue; Boca Ciega Drive; North Bayshore Drive; Vivian Drive; Palm Street; Crystal Drive; 131st Avenue; Lillian Drive; Lyn Way; B – Street.

Policy 4.5.4: The master drainage plan shall maintain the standards established by Florida Department of Environmental Protection for Outstanding Florida Waters and Aquatic Preserve designations of Boca Ciega Bay.

COASTAL MANAGEMENT AND CONSERVATION ELEMENT

OBJECTIVE 1.1: The City shall protect the quality and quantity of surface and ground water.

Policy 1.1.3: The City shall continue to upgrade the drainage system and through the land development regulations, implement stormwater treatment for water quality.

Policy 1.1.4: The City shall protect water storage and quality enhancement functions of wetlands and floodplain areas through land acquisition, if feasible, enforcement of laws, and the application of land and water management practices which provide for compatible uses.

OBJECTIVE 1.2: The City shall strictly enforce regulations for development within the 100-year floodplain, as established by the federal government.

Policy 1.2.1: The land development regulations shall continue to require that runoff rates, volumes, and pollutant loads for new development and redevelopment do not exceed predevelopment conditions.

Policy 1.2.2: Recognizing that the community is located within the 100-year floodplain, the City shall continue to strictly enforce all appropriate federal, state, and regional coastal construction codes and coastal setback regulations.

Policy 1.2.3: The City shall protect the natural functions of the 100-year floodplain so that flood-carrying and flood-storage capacities are maintained.

Policy 1.2.4: The City shall strictly enforce the floodplain management provisions contained in the land development regulations, in order to preserve hydrologically significant wetlands and other natural floodplain features.

Policy 1.2.5: The City shall continue to enforce land development regulation standards which minimize the amount of impervious surface in order to promote groundwater filtration, minimize runoff, and stabilize water quality.

OBJECTIVE 1.3: The City shall conserve or improve wetlands, aquatic resources, and wildlife population and habitat to maintain their environmental and recreational value.

Policy 1.3.6: Marine wetlands, barrier island property containing numerous vegetative communities, and/or shoreline locations with limited habitat diversity shall be considered priorities for environmental land acquisition.

Policy 1.3.7: The City shall continue to preserve Little Bird Key and the adjacent island in their natural state.

OBJECTIVE 1.4: The City shall conserve, appropriately use, and protect native vegetation.

Policy 1.4.3: Land development regulations shall encourage shorelines lacking wetland vegetation to be planted with native vegetation in order to minimize potential flood damage, stabilize the shoreline, trap sediments and other non-point source pollutants, and provide additional habitat for fish and wildlife.

Policy 1.4.6: Pilings, not fill, shall be used to elevate structures in floodprone areas.

OBJECTIVE 1.8: The City shall cooperate with the State of Florida and other local jurisdictions in an effort to maintain the Boca Ciega Bay Outstanding Florida Waters designation.

Policy 1.8.4: The City shall coordinate with neighboring municipalities, Pinellas County, and the Tampa Bay Regional Planning Council to protect regional estuaries, providing adequate sites for water-dependent uses, preventing estuarine pollution, controlling surface water runoff, protecting living marine resources, reducing exposure to natural hazards, and ensuring public access.

Policy 1.8.5: Natural watercourses shall be maintained in their natural state and protected from alteration.

OBJECTIVE 1.9: The City of Madeira Beach shall protect and restore its beaches, dunes, and natural system from the impacts of development through continued enforcement of coastal construction standards.

Policy 1.9.1: Construction seaward of the Coastal Construction Control Line shall be subject to the permitting procedures pursuant to Florida Statutes.

Policy 1.9.2: The City, through the provision of public information, shall encourage the planting of native marine vegetation in front of seawalls to act as a natural buffer against damage from tides and flooding.

Policy 1.9.3: The City shall adopt beach management practices, which shall regulate excavations, disturbance of native vegetation, and activities which affect the natural fluctuation of the dunes.

Policy 1.9.4: The City shall continue a program for the restoration and maintenance of the coastal dune system. The program shall include: stabilization projects utilizing native vegetation; and; an educational program emphasizing the need to protect the coastline.

Policy 1.9.7: The land development regulations shall require that the replacement material for failed or damaged existing concrete seawalls along the Gulf of Mexico be rip-rap or planted native vegetation, e.g., marsh grasses and dune vegetation.

OBJECTIVE 1.10: The City shall comply with all county, state, and federal regulations governing the protection of coastal resources.

Policy 1.10.1: The City shall comply with all county, state, and federal regulations governing hurricane evacuation, provision of public beach access, provision of infrastructure in the Coastal High Hazard Area, regulation of stormwater drainage, protection of wetland vegetation, and protection of species with special status.
Policy 1.10.2: The city beach management practices shall be coordinated with the efforts of neighboring municipalities.

Policy 1.10.3: The City shall review the comprehensive plans of the neighboring municipalities and adjacent coastal counties to determine if coastal resources of the barrier islands are being managed in a consistent manner.

Policy 1.10.5: Pursuant to Section 163.3178, Florida Statutes, the level-of-service standards for transportation, infrastructure, and recreation/open space for the coastal planning area shall be identical to those for the city as a whole.

OBJECTIVE 2.1: Because Madeira Beach lies primarily within the Coastal High Hazard Area, the City shall limit public expenditures that support development, except for restoration or enhancement of natural resources, the maintenance or repair of existing infrastructure, or facilities determined to be an overriding benefit.

Policy 2.1.1: The Coastal High Hazard Area shall be defined as that area within Evacuation Level A, as established by the *Tampa Bay Region Hurricane Evacuation Study Update*, published by the Tampa Bay Regional Planning Council and as defined by Rule 9J-5.003, Florida Administrative Code.

Policy 2.1.2: The City shall not support or finance new local transportation corridors that would encourage further growth or higher population densities within the Coastal High Hazard Area beyond that anticipated in this plan, although existing corridors may be maintained or improved as necessary to protect the health, safety, and welfare of residents.

Policy 2.1.3: The City shall not support sewer and water line extensions or expansions that would encourage further growth or higher population densities within the Coastal High Hazard Area, except as anticipated within this comprehensive plan.

OBJECTIVE 2.2: Due to its location in the Coastal High Hazard Area, the City shall not increase densities above those established in this comprehensive plan, as delineated by Map LU-4, Future Land Use.

Policy 2.2.1: The City shall maintain or reduce allowable density in the Coastal High Hazard Area, consistent with *Map LU-4, Future Land Use*.

Policy 2.2.2: The City of Madeira Beach shall continue to implement growth management standards limiting development to currently planned densities and intensities within the Coastal High Hazard Area, consistent with *Map LU-4, Future Land Use*.

Policy 2.2.3: The City shall continue to seek opportunities for public land acquisition and management for recreation, conservation, and preservation areas within the Coastal High Hazard Area.

OBJECTIVE 2.3: The City shall maintain or reduce hurricane evacuation times.

Policy 2.3.1: Through the Pinellas County Metropolitan Planning Organization (MPO), the City shall coordinate with state, regional, and county agencies to ensure that major evacuation routes are adequately maintained and, when necessary, improved to facilitate an efficient and safe evacuation.

Policy 2.3.2: The City, in cooperation with the Pinellas County Department of Emergency Management and the South Pinellas County Chapter of the American Red Cross, shall sponsor preparedness seminars to increase hurricane awareness.

Policy 2.3.3: City emergency response personnel and volunteers shall coordinate pre- and post-event activities with county and state emergency response agencies in order to plan for safe and efficient evacuations and re-entries.

OBJECTIVE 2.4: The City shall reduce the risk of exposure of human life and public and private property to natural disasters, through preparedness planning and implementation of hazard mitigation measures.

Policy 2.4.1: The City, in coordination with the Pinellas County Department of Emergency Management, shall maintain and upgrade its comprehensive disaster plan, which shall address the four phases of comprehensive emergency management: preparedness, response, recovery and mitigation.

Policy 2.4.2: The city emergency management coordinator shall continue to oversee the development and revision of the city disaster plan; act as a liaison between state, regional, county, and city emergency response and planning agencies; and ensure coordination between emergency management and growth management activities.

Policy 2.4.3: The City shall review the existing coastal construction building code and the coastal construction standards embodied in the *Coastal Zone Protection Act*, and shall strictly enforce their implementation through the building inspection process.

Policy 2.4.4: Recognizing that the community is located primarily within the Coastal High Hazard Area and the 100-year floodplain, the City shall adopt and strictly enforce all appropriate federal, state, and local coastal construction codes, coastal setback requirements, special Coastal Construction Control Line facility siting restrictions, and floodplain management regulations.

Policy 2.4.5: Special care facilities, such as hospitals and nursing homes, shall not be located in the Coastal High Hazard Area. Assisted living facilities are discouraged in the Coastal High Hazard Area unless adequate provisions for safe and efficient evacuation and shelter are ensured.

Policy 2.4.6: The City Commission shall review all elements of the *Pinellas County Comprehensive Emergency Management Plan* to assure that hazard mitigation considerations are effective and implemented within its area of responsibility.

OBJECTIVE 3.1: The City shall implement the post-disaster recovery procedures outlined in its disaster plan.

Policy 3.1.1: The city emergency management coordinator shall designate appropriate staff to perform the following tasks:

- Hear preliminary damage reports following a disaster;
- Take necessary steps to seek financial assistance from the appropriate state and federal agencies;
- Authorize clean-up and repairs necessary to protect the public health, safety, and welfare;
- Identify areas within the community where minor, moderate, and major damage has occurred;
- Recommend to the City Commission temporary building moratoria for building activities not essential to protect health, safety, or welfare;
- Recommend to the City Commission appropriate hazard mitigation policies which should be implemented in response to the disaster; and Prepare a report evaluating post-disaster redevelopment response and make recommendations for necessary changes to this comprehensive plan.

OBJECTIVE 3.2: By 2001, in order to effectively manage the timing and sequence of reconstruction, the City will establish a set of reconstruction permitting procedures.

Policy 3.2.1: Following a major hurricane or other disaster, the City Commission may adopt a temporary post-disaster building moratorium to allow sufficient time for damage assessment, the identification of redevelopment opportunities, and hazard mitigation policy implementation.

Policy 3.2.2: The City shall adopt post-disaster redevelopment procedures which will expedite permitting for minor repairs including: development plan review, engineering approval, building permitting, and shall provide that all permitting is coordinated with the appropriate agencies and is consistent with the objectives of this comprehensive plan.

OBJECTIVE 3.3: The City shall implement reconstruction and redevelopment strategies which will be used to promote hazard mitigation.

Policy 3.3.1: Where financially feasible, property which has received recurring major hurricane damage (total devastation) from storm surge may be publicly acquired, or designated Preservation on *Map LU-4, Future Land Use*, to prevent redevelopment of the property to its pre-disaster land use.

Policy 3.3.2: The City shall consider one or more of the following strategies in those areas which receive major or moderate damage: Reduction of permissible density or intensity of development in the area; Reconstruction according to more stringent building and construction standards; and Public acquisition of damaged areas.

Policy 3.3.3: The City shall interrelate hazard and non-hazard mitigation goals during reconstruction decision-making, including the following objectives: Enhancement of local recreational and open space opportunities; Enhancement of local public beach access; Enhancement and restoration of local natural ecosystems; Reduction of traffic congestion, noise, and other transportation related problems; and Enhancement of the long-term economic vitality of the local commercial base.

RECREATION & OPEN SPACE

OBJECTIVE 1.3: Lands designated as Preservation or Recreation/Open Space will be protected from incompatible land uses.

Policy 1.3.5: The City shall encourage beach renourishment programs.

INTERGOVERNMENTAL COORDINATION

OBJECTIVE 1.5: Identify and describe joint processes for collaborative planning on population projections, school siting, facilities subject to concurrency, facilities with countywide significance, and problematic land uses.

Policy 1.5.6: The City will coordinate and cooperate with Pinellas County for joint projects identified in the municipal stormwater management plan and the *Pinellas County Stormwater Management Plan*.

Policy 1.5.9: The City will forward notice of proposed future land use plan amendments with potential hurricane shelter and evacuation route impacts to the Tampa Bay Regional Planning Council and the Pinellas County Emergency Management Department will be consulted if necessary and appropriate, to ascertain the amount of currently available shelter space.

OBJECTIVE 2.1: CONSIDERATION OF LOCAL PLAN EFFECTS. The City shall review its comprehensive plan to:

- Identify and coordinate issues that are of mutual interest to other entities;
- Address through coordination mechanisms, the impacts of development on other entities; and
- Coordinate compatible level-of-service standards for public facilities with any state, regional, or local entity having operational and maintenance responsibilities for such facilities.

Policy 2.1.4: The City will use the Tampa Bay Regional Planning Council *Hurricane Evacuation Study* for guidance pertaining to residential future land use densities in coastal high hazard areas.

Policy 2.1.14: The City will continue to administer its standards for shoreline protection and dock placement with the Pinellas County Water and Navigation Control Authority.

Policy 2.1.17: After adoption of the *Pinellas County Local Hazard Mitigation Strategies*, if necessary, the City will amend its comprehensive plan and land development regulations based upon the strategies.

Policy 2.1.18: The City will participate in the continuing meetings of the Hazard Mitigation Committee (after August 1, 1999), to ensure that the strategies are implemented and updated.

CAPITAL IMPROVEMENTS

OBJECTIVE 1.4: Public expenditures that subsidize development in Coastal High Hazard Areas shall be limited to those improvements anticipated in this comprehensive plan or determined by the Board of City Commissioners to be an overriding public benefit.

Policy 1.4.1: The City shall expend funds in Coastal High Hazard Areas only for the replacement and renewal of public facilities in order to maintain adopted levels of service.

OBJECTIVE 1.5: CONCURRENCY MANAGEMENT SYSTEM. The City of Madeira Beach shall provide, or require provision of, needed infrastructure for development and redevelopment concurrently with their impacts through the use of a concurrency management system, implementation monitoring of the comprehensive plan, and enforcement of development regulations.

Policy 1.5.4: The City of Madeira Beach shall use the following levels of service to determine the impacts of development and redevelopment:
Coastal Management: The City shall protect water storage and water quality enhancement functions of wetlands and floodplain areas through land acquisition if feasible, enforcement of laws, and the application of land and water management practices which provide for compatible uses.

ATTACHMENT I
City of St. Petersburg Comprehensive Plan Excerpts Related to Hazard Mitigation

From the City of St. Petersburg Comprehensive Plan (as amended March 3, 2005):

FUTURE LAND USE ELEMENT

OBJECTIVE LU6: Development activities of all kinds within the coastal hazard areas shall be consistent with the goals, objectives and policies of the Coastal Management Element of the Comprehensive Plan and any interagency hazard mitigation report recommendations deemed appropriate by the City.

Policy LU6.1 Requests for residential density increases within the Coastal High Hazard Zone shall not be approved.

Policy LU6.2 All approval of new proposed development will consider the hurricane evacuation level/location of the proposed development, and provide appropriate mitigation.

Policy LU6.3 Prohibit the new construction of hospitals, nursing homes, and convalescent homes in Evacuation Level A zones, discourage the siting or expansion of these facilities in Evacuation Level B zones and limit the expansion of existing sites to the boundaries of the currently developed lot.

Policy LU6.4 Prohibit the siting of new mobile home parks within the Evacuation Level A zone and limit the expansion of existing sites to the boundaries of the currently developed lot.

Policy LU6.5 When establishing Future Land Use Plan designations through a Comprehensive Plan amendment for annexed properties located within the Coastal High Hazard Area there shall be no net increase in residential density as compared to the Future Land Use Plan of Pinellas County designation(s) existing at the time of annexation of a property without the prior written approval of DCA and Pinellas County.

Policy LU6.6 Opportunities to decrease residential development potentials on the remaining vacant tracts in the CHHA through plan amendments to less intensive uses, land purchase or transfer of development rights shall be considered.

Policy LU6.7 The City will encourage the mitigation, reduction or elimination of uses that are inconsistent with any interagency hazard mitigation report recommendations that the City determines appropriate.

Policy LU6.8 The City will review the Tampa Bay Regional Planning Council's (TBRPC) Hurricane Evacuation Study for issues that pertain to requests for residential density increases and the general application of residential future land use densities in coastal high hazard areas.

OBJECTIVE LU7: The City will continue to revise and amend the land development regulations, as necessary, to ensure compliance with the requirements of Chapter 163.3202, Florida Statutes and Chapter 9J-24 F.A.C. The City will amend its land development regulations consistent with the requirements of Chapter 163.3202, Florida Statutes and Chapter 9J-24 F.A.C. so that future growth and development will continue to be managed through the preparation, adoption, implementation and enforcement of land development regulations that are consistent with the Comprehensive Plan.

Policy LU7.1 Pursuant to the requirements of Chapter 163.3202 F.S. and Chapter 9J-24 F.A.C. the land development regulations will be amended, as necessary, to ensure consistency with the goals, objectives and policies of the Comprehensive Plan. The development regulations include:1. Sign Ordinance; 2. Subdivision Ordinance; 3. Zoning Ordinance; 4. Historic Preservation Ordinance; 5. Drainage and Surface Water Management Ordinance; 6. Landscaping

for Vehicular Use Areas Ordinance; 7. Flood Damage Prevention Ordinance; 8. Vegetation Ordinances; 9. Concurrency Ordinance.

OBJECTIVE LU8: The City shall continue to define and regulate nonconforming and grandfathered uses consistent with the requirements of Chapter 163, F.S. for the purpose of reducing or eliminating land uses that are inconsistent with the character of the community including repetitive loss and other properties that do not comply with minimum FEMA flood elevation standards as targeted in Policies CM11.11 and CM11.12. The regulations may include provisions for eliminating or reducing uses that are inconsistent with interagency hazard mitigation reports.

Policy LU8.1 Nonconforming and grandfathered uses shall be defined and regulated in a manner consistent with the requirements of the Zoning Ordinance and Chapter 163, F.S.

Policy LU8.2 Nonconforming uses determined to be severely incompatible may be phased out through an appropriate amortization schedule as defined in the land development regulations.

Policy LU8.3 The City will amend the Nonconformities and Grandfathered Uses and Structures section of the Zoning Ordinance to implement provisions that encourage the elimination or reduction of uses inconsistent with interagency hazard mitigation report recommendations that the City deems appropriate.

OBJECTIVE LU13: The City shall support efforts that facilitate coordination of planning between local governments and the School Board for the location and development of public educational facilities.

Policy LU13.4 In addition to consistency with the St. Petersburg Comprehensive Plan, the proposed location of a new or expanded public educational facility of the School Board within one of the land use categories listed in Policy 13.2 shall be reviewed and considered with the following general criteria:… 7. The proposed location is not in conflict with the County's Stormwater Management Plan or the City of St. Petersburg's Stormwater Management Master Plan. 8. The proposed location is not in the Coastal High Hazard Area (CHHA), a velocity flood zone or a floodway.

CONSERVATION ELEMENT

OBJECTIVE C1: The City of St. Petersburg shall attempt to reduce the potential for property damage and safety hazards caused by storm flooding through complying with or exceeding of minimum FEMA regulations.

Policy C1.1 The City will actively enforce minimum building standards identified in the adopted Flood Damage Prevention Ordinance for construction within the 100-year flood plain.

Policy C1.2 The City will cooperate with the Federal Emergency Management Agency to regularly update the 100-year flood plain and to continue FEMA regulations.

OBJECTIVE C2: The City of St. Petersburg shall work toward reducing the existing quantity and improving the quality of Stormwater runoff to surface water bodies; and improved water quality in Tampa Bay through implementation of the SWIM Tampa Bay Management Plan.

Policy C2.3 Improvements to the municipal drainage system shall be designed with appropriate water quality control techniques, such as those described in the Drainage Subelement of the Comprehensive Plan.

Policy C2.4 Alterations and improvements to the drainage system shall preserve, to the maximum extent possible, natural drainage characteristics (such as creek banks and wetlands), existing vegetation and trees, and natural topography.

Policy C2.5 Continuing maintenance to Stormwater systems will be performed in a timely and adequate manner which minimizes adverse environmental impact. Responsibility for maintenance will be determined prior to the granting of new development approval.

Policy C2.6 The City will cooperate with and assist the SWFWMD SWIM program in the implementation of initiatives and restoration projects identified in the Tampa Bay Management Plan.

OBJECTIVE C3: The City of St. Petersburg shall protect existing water quality of surface water bodies such as bays, lakes, harbors, bayous, the extent of their beaches and shores from degradation due to upland development by requiring review and approval of dredge and fill permits by the appropriate agencies.

Policy C3.1 Best management practices will be required to minimize soil erosion and to protect waterways from filling with debris and sediment during construction or earth moving.

Policy C3.2 The vegetative fringe along all shorelines will be preserved to the fullest extent possible. Vertical seawalls shall be permitted only when consistent with applicable regulations as found in Florida Statutes Chapter 161 and 403 and by Florida Administrative Code as applicable.

Policy C3.3 Restoration of seawalled, ditched or other severely altered shorelines and channels to natural conditions will be instituted wherever possible. Such improvements include natural slopes, indigenous plant communities and seagrasses.

Policy C3.7 The City will continue to administer its standards for shoreline protection and dock placement with the Pinellas County Water and Navigation Control Authority.

OBJECTIVE C4: The City of St. Petersburg shall protect green open space areas and the native vegetation and wildlife in St. Petersburg in the manner identified in the Recreation/Open Space Element of the Comprehensive Plan so as to maintain a citywide total of 50% green permeable open space.

Policy C4.2 The City shall maintain and seek to expand the City's inventory of green permeable open space so as to provide maximum area for shallow aquifer recharge and Stormwater filtration/percolation, oxygen production, visual buffer and wildlife habitat. This shall be accomplished through implementation of land development regulations as described in Section 3 of the Recreation/Open Space Technical Support Document, Objective R4 and Policies R4.1-R4.2 of the Comprehensive Plan.

Policy C4.6 The City, in order to reduce Stormwater runoff, increase recharge to the aquifer and increase overall green permeable open space, will investigate FAR and ISR bonus incentives to increase a site’s overall pervious surface. Appropriate incentives will be proposed for adoption by December 31, 1998.

OBJECTIVE C7: The City shall require new development and redevelopment sites to be located and designed to conserve, protect and appropriately use the existing natural vegetative and soil resources of the land in a manner which complies with the City's land development regulations relating to drainage, landscaping, zoning and vegetation.

Policy C7.3 Siltation control devices preventing erosion will be required for all development and redevelopment activity which includes either work adjacent to a surface water body or the placement or removal of fill.

Policy C7.11 Developments requiring special exception or site plan review (SE & SPR cases) shall identify viable naturally functioning native vegetative communities. A portion of the existing native vegetation shall be preserved or retained. The City shall adopt land development regulations within six months of final adoption of this policy which implement the following

requirements: a. For residential and residential mixed use developments within the coastal high hazard zone and greater than 2.5 acres and for residential and residential mixed use developments greater than 20 acres outside of the coastal high hazard zone – 25 percent of the native vegetation shall be preserved;

COASTAL MANAGEMENT ELEMENT

OBJECTIVE CM6: The City shall work toward reducing the existing quantity and improving the quality of stormwater runoff to surface water bodies; and improve water quality in Tampa Bay through implementation of the SWIM Tampa Bay Management Plan.

Policy CM6.7 Criteria for the selection of priority drainage improvements will include recreational and commercial uses of surface waters adjacent to stormwater outfalls.

Policy CM6.11 Natural drainage characteristics will be retained, restored and enhanced, where possible, for filtration of pollutants, control of runoff rates and aquifer recharge.

Policy CM6.12 Criteria used by the City Engineering and Stormwater Department to review drainage plans will include Best Management Practices for stormwater water quality control as identified by SWFWMD and FDEP.

Policy CM6.11 Natural drainage characteristics will be retained, restored and enhanced, where possible, for filtration of pollutants, control of runoff rates and aquifer recharge.

Policy CM6.12 Criteria used by the City Engineering and Stormwater Department to review drainage plans will include Best Management Practices for stormwater water quality control as identified by SWFWMD and FDEP.

OBJECTIVE CM10 A: No public funds shall be used for infrastructure and services which subsidize population concentrations in the coastal high hazard area beyond the planned densities identified on the adopted Land Use Plan other than the improvements identified in the Capital Improvements Element of the *Comprehensive Plan* and that which is necessary to support the limited remaining infill development and for overriding health and safety reasons.

OBJECTIVE CM10B: The City shall direct population concentrations away from known or predicted coastal high hazard areas consistent with the goals, objectives and policies of the Future Land Use Element in the St. Petersburg *Comprehensive Plan*. Policies:

Policy CM10.1 The City shall designate the coastal high hazard area as the hurricane evacuation level “A” zone.

Policy CM10.2 The City shall evaluate proposed new transportation corridors in the coastal high hazard area for effect upon hurricane evacuation capacity.

Policy CM10.3 Expenditures for flood control, natural resource enhancements or the maintenance of existing utilities and services, including fire and recreation, shall be permitted in the coastal high hazard area.

Policy CM10.4 Expanded infrastructure in the coastal high hazard area shall only be permitted as is necessary to protect the public health, welfare and safety, including stormwater and sewer improvements and to service the demand generated by the planned for development identified in the Future Land Use Plan.

Policy CM10.5 The City should not accept operation and maintenance of private roads or facilities in the coastal high hazard area.

Policy CM10.6 The City shall direct population concentrations away from known or predicted coastal high hazard areas by not locating water line extensions in the coastal high hazard area, beyond that which is necessary to service planned zoning densities as identified in the adopted Land Use Plan.

OBJECTIVE CM11: The City will reduce natural hazard impacts through compliance with FEMA regulations and by targeting repetitive flood loss and vulnerable properties for mitigation.

Policy CM11.1 Variances to required flood elevations shall not be approved unless documented to be in the best interest of the public health, safety and welfare.

Policy CM11.2 The City shall enforce applicable recommendations of Post-Disaster Hazard Mitigation plans, required under Section 406 of the Disaster Relief Act of 1974.

Policy CM11.3 The City shall minimize the disturbance of natural shorelines which provide stabilization and protect landward areas from storm impacts.

Policy CM11.4 Comprehensive plan amendments shall consider the effect on hazard mitigation.

Policy CM11.5 Solid waste and commercial hazardous waste management facilities, including regional storage, treatment or transfer sites shall not be located in the hurricane vulnerability zone.

Policy CM11.7 Site plan review criteria shall consider flood potential and hurricane hazards, including evacuation levels and sheltering, in a comprehensive manner.

Policy CM11.8 Areas within the coastal area of St. Petersburg in need of redevelopment are identified in the Land Use element of the Comprehensive Plan pursuant to 9J-5.012(2)(a) by the City of St. Petersburg pursuant to Chapter 163, Florida Statutes, the Community Redevelopment Act of 1969.

Policy CM11.9 The City will encourage mitigation, reduction or elimination of uses that are inconsistent with any interagency hazard mitigation report recommendations that the City deems appropriate.

Policy CM11.10 The City shall continue to participate in the Federal Emergency Management Agency's National Flood Insurance Program.

Policy CM11.11 The City shall maintain an inventory of repetitive loss properties and target hazard mitigation programs to these properties.

Policy CM11.12 Through hazard mitigation programs and compliance with FEMA flood elevation requirements, at least five (5) previously noncompliant structures per year will be brought into conformance with FEMA flood elevation standards or flood proofed consistent with FEMA standards.

Policy CM11.12 After adoption of the Pinellas County Local Hazard Mitigation Strategies by Pinellas County, the City will consider amendments to its comprehensive plan and land development regulations based upon the recommendations therein.

Policy CM11.13 The City will attend the continuing meetings of the Hazard Mitigation Committee to ensure that the strategies are implemented and updated as necessary.

OBJECTIVE CM12: By 1998, the City shall adopt a post-disaster redevelopment plan to include policies which shall decrease future public and private vulnerability to future storms through compliance with applicable state, county and regional coastal construction regulations. The post disaster redevelopment plan shall address the recovery phase and long term redevelopment.

Policy CM12.1 Damage assessment teams shall identify immediate repair and clean-up actions necessary for public health and safety and long-term repair and redevelopment activities.

Policy CM12.2 The damage assessment teams shall be trained in estimating and documenting damage.

Policy CM12.3 Temporary building moratoriums may be declared in the coastal high hazard area when 50% or more homes have been destroyed in order to assess impacts and feasibility of redevelopment.

Policy CM12.4 The City shall maintain records consistent with the Federal Insurance Administration's listing of community selection factors for assistance in purchasing properties under Section 1362 of the National Flood Insurance Act.

Policy CM12.5 Damaged infrastructure shall be replaced concurrent with redevelopment.

Policy CM12.6 The City shall identify properties recommended for acquisition after a storm.

Policy CM12.7 By June 30, 1998, the City shall evaluate Pinellas County and other local government post disaster guidelines and propose appropriate guidelines for post-disaster redevelopment in St. Petersburg. The proposed guidelines will also address the relocation, mitigation or replacement of CHHA infrastructure and will implement the minimum requirements of Chapter 9J-5.012(3)c.5 F.A.C. and the City's Coastal Management Element. The post disaster guidelines shall distinguish between the recovery phase and long-term redevelopment including the removal, relocation or structural modification of damaged and unsafe structures and infrastructure.

Policy CM12.8 By October 31, 1998 the City shall develop a complete inventory of all infrastructure located in the CHHA. This inventory shall include a hazard vulnerability assessment.

OBJECTIVE CM13: The City shall cooperate with state, regional and county agencies to maintain or reduce hurricane evacuation times; and actively work with the Red Cross in the identification of emergency shelters to provide, at minimum, space for the population in Evacuation Zone A, B and C.

Policy CM13.1 The City shall cooperate with the County to evaluate critical links and major evacuation routes to determine where operational improvements, such as allowing for one-way direction of traffic, rerouting of traffic or preempting signals, can be made to reduce delays during clearance.

Policy CM13.2 The City shall implement the strategies identified in Coastal Management Element Subsection 6.6, "Measures to Maintain or Reduce Evacuation Times": 1. Prioritize roadway maintenance and construction projects on the identified critical links and on major evacuation routes; 2. Maintain acceptable levels of service on regional evacuation routes; 3. Require all new mobile home parks in the City that are located outside hurricane surge areas to construct and maintain a private shelter (meeting minimum Red Cross Evacuation Shelter criteria) for residents of that park; 4. Assist the Red Cross in identifying more public shelters within St. Petersburg to reduce the number of vehicles traveling through St. Petersburg as they attempt to leave the region; 5. Evaluate any zoning changes in evacuation levels A, B, or C that would increase the residential densities in those areas for their impact upon evacuation shelter availability; 6. Implement the state's Hurricane Preparedness Rule (9J-2.0256) which assesses the public shelter impact of large-scale development; 7. Consider a form of early or "phased evacuation", especially for the barrier island communities of St. Petersburg finger-fills. This will reduce the queuing experienced at the County's critical link.

Policy CM13.3 Public information before and during the emergency shall stress that evacuees seek alternative types of refuge and that persons on high ground offer their homes as refuge to friends and relatives in hurricane vulnerable areas.

Policy CM13.4 The City shall work with Pinellas County local governments, the Red Cross, the School Board and other appropriate agencies to identify solutions to the public shelter deficit in Pinellas County by December 31, 1998.

Policy CM13.5 The City shall maintain a record of major evacuation routes and critical intersections known historically to experience freshwater flooding and include them in the prioritizing of roadway maintenance and construction projects.

Policy CM13.6 The City shall assure that an up-to-date version of each hospital and nursing home disaster plan that is required by state law is kept on file with the Disaster Preparedness Coordinator.

Policy CM13.7 The City shall continue to review the Disaster Operations Manual annually and update the manual as new information and policies are available.

Policy CM13.8 The City shall encourage transportation alternatives for persons evacuating to a public shelter including the Pinellas County Emergency Management Department's pre-registration program for evacuation assistance.

Policy CM13.9 The City will coordinate its hurricane recovery plans with the Pinellas County Disaster Advisory Committee.

Policy CM13.10 The City will notify Pinellas County Emergency Management Department of the availability of any facilities within its jurisdiction that may be used as public shelter space.

OBJECTIVE CM14: Subsequent to adoption of the Comprehensive Plan, approval of development within the coastal area shall be conditioned upon maintenance of adopted level of service standards for sanitary sewer, potable
water, drainage, transportation and recreation.

Policy CM14.1 Infrastructure improvements shall be phased according to the Capital Improvements Element, as adopted and amended.

Policy CM14.2 One of the criteria for selecting roadway improvements shall include consideration of clearance times.

Policy CM14.3 Improvements to infrastructure in flood prone areas shall be modified to include repairs that minimize disruption of service.

Policy CM14.4 Required infrastructure, as defined by adopted level of service standards, shall be available to serve development or redevelopment in the coastal area at the densities identified on the adopted Land Use Plan.

OBJECTIVE CM16: The City shall encourage and support development and redevelopment opportunities at the Port of St. Petersburg, including the provision of public facilities, in accordance with the Port Master Plan and all other federal, state and local laws and regulations.

Policy CM16.4 Prior to development or redevelopment activity on the Port property, site plan approval will be required. At that time, the stormwater management system for the site will be required to meet all City and SWFWMD stormwater management criteria.

TRANSPORTATION ELEMENT

OBJECTIVE T5: The City shall ensure the safe accommodation of motorized and non-motorized traffic while reducing the incidence of vehicular conflicts within the City's major transportation corridors.

Policy T5.9 The City shall ensure the availability of adequate transportation facilities for the safe and timely evacuation of high risk areas to prevent loss of life due to natural disasters by seeking funding for needed improvements to hurricane evacuation routes and for facilities providing access to these routes. Road improvement projects shall be scheduled in the appropriate City, County, MPO and State work programs.

Policy T5.10 The City shall participate in and support hurricane evacuation planning activities in coordination with the Pinellas County Department of Emergency Management and the Tampa Bay Regional Planning Council.

OBJECTIVE T12: The City shall provide equitable transportation service to all residents and accommodate the special transportation needs of the elderly, disabled, low-income citizens and other transit dependent persons.

Policy T12.3 In cooperation with the Pinellas County Emergency Management Administration, the City shall maintain an inventory of hurricane evacuation –transportation disadvantaged persons who would be included in an evacuation order resulting from the threat of a hurricane.

OBJECTIVE T18: The City shall plan and develop a transportation system that preserves environmentally sensitive areas, conserves energy and natural resources, promotes community aesthetic values and is in compliance with all federal, state and local regulations regarding environmental protection.

Policy T18.1 The City shall avoid transportation improvements which encourage or subsidize increased development in coastal high hazard areas or environmentally sensitive areas identified in the Coastal Management and Conservation Elements.

Policy T18.3 New roadways shall be designed to prevent and control soil erosion, minimize clearing and grubbing, minimize stormwater runoff and meet minimum requirements for stormwater retention and treatment, and avoid unnecessary changes in drainage patterns. These roadways shall be designed to make them compatible with the surrounding environment, complement adjacent development and provide an aesthetically pleasing visual experience to the user.

OBJECTIVE H4: The City shall allow new mobile homes in existing mobile home parks when vacancies exist and the City shall allow mobile homes to be developed on vacant mobile home park - zoned land except unless this policy may conflict with some other policy related to public health, safety, or welfare, i.e, the coastal high hazard area.

Policy H4.1 The City shall review and issue permits for mobile homes that meet the requirements of the building code and zoning ordinance.

OBJECTIVE H5: The City shall permit group homes in all residential districts in accordance with the standards and criteria defined in the Zoning Ordinance.

Policy H5.1 Community - based residential care facilities licensed by the State of Florida Health Care Administration shall be permitted at convenient, adequate and non-isolated sites within the residential or institutional areas of the City, where there is adequate infrastructure; provided they meet all the requirements of the zoning ordinance including the specified spacing to another facility, are not within the Coastal High Hazard Area or susceptible to documented or anticipated flooding.

OBJECTIVE H10: The City shall implement the 5 Year Strategies contained in the adopted Consolidated Plan to provide housing and services for the homeless, promote transition to independence and prevent homelessness, including: • Facilitating the rehabilitation/expansion of existing emergency, transitional and/or permanent supportive housing and facilities for the homeless by renovating/expanding existing emergency shelters to increase the capacity by 100 beds. • Facilitating the acquisition/rehabilitation of vacant properties for emergency, transitional and/or permanent supportive housing and facilities for the homeless by developing one homeless inebriate reception-recovery center.

Policy H10.3 The City shall continue to seek state and federal funding for additional emergency, transitional and permanent housing to supplement that being provided by private non-profits and religious organizations.

DRAINAGE SUBELEMENT

OBJECTIVE D1: The City shall adopt a level of service standard and ensure that new development and redevelopment as defined by applicable city, regional, state and federal regulations meets the level of service as adopted by the City. Drainage is currently regulated by City Code Chapter 16.311, which requires drainage plans reviewed by the City to meet a 10-year, 1-hour design storm standard. The adopted level of service shall consist of three parts: 1. Due to the back log of stormwater improvement needs and the time needed to implement improvements to the municipal drainage system, existing conditions will be adopted as the level of service. 2. Construction of new and improvements to existing surface water management systems require permits from SWFWMD, except for projects specifically exempt. As a condition of municipal development approval, new development and redevelopment within the City which requires a SWFWMD permit according to Rules 40-D-4 and 40-D-40 shall be required to obtain a SWFWMD permit and meet SWFWMD water quantity and quality design standards. Development which is exempt from SWFWMD permitting requirements shall be required to obtain a letter of exemption. 3. Construction of new and improvements to existing surface water management systems will be required to meet design standards outlined in the Drainage Ordinance, Chapter 16.314, St. Petersburg City Code; using a minimum design storm of 10 year return frequency, 1 hour duration, rainfall intensity curve Zone VI, Florida Department of Transportation. Improvements to the municipal drainage system will be designed to convey the runoff from a 10-year, 1-hour storm event.

Policy D1.3 Existing municipal drainage facilities will be adequately maintained by the City's Engineering and Stormwater Department.

Policy D1.4 St. Petersburg will continue to undertake special studies of drainage areas with specific problems. Recommendations from such studies may influence review criteria and design storm requirements for drainage systems in those areas.

Policy D1.5 The City will coordinate updates of its Stormwater Management Master Plan with Pinellas County and neighboring governments in shared drainage basins.

OBJECTIVE D2: As the City rehabilitates and upgrades drainage facilities, drainage projects will be identified in the Capital Improvements Element of the Comprehensive Plan and will be constructed in compliance with the adopted level of service standard.

Policy D2.1 The projects will be undertaken in accordance with the schedule provided in the Capital Improvements Element of this plan.

Policy D2.2 The City will seek and consider the recommendations of regional, state and federal agencies and other City Departments in the design and construction of these projects.

Policy D2.3 The City will provide necessary protective measures to minimize conditions that would create adverse health and/or environmental impacts during construction of these projects.

OBJECTIVE D3: The City of St. Petersburg commits to the cost-effective and timely implementation of the Stormwater Management Master Plan. The implementation and timing of specific projects are subject to available funding, community acceptance and regulatory constraints.

Policy D3.1 The City will continue to implement the Stormwater utility fee as a dedicated source of funding for the Stormwater Management Master Plan.

Policy D3.2 The City of St. Petersburg will implement the Stormwater Management Master Plan and update the prioritized municipal drainage improvement projects based on current applicable regulations.

Policy D3.3 Priorities for specific project implementation are based on 1) prerequisite downstream improvements, 2) flooding nodes per basin, and 3) cost to implement versus area protected.

Policy D3.4 The City will pursue completion of the estimated 85 projects listed in the revised SMMP by December 31, 2025.

OBJECTIVE D4: The City shall extend the useful life of existing drainage facilities through efficient and timely maintenance of those facilities according to the maintenance schedule established by the Engineering and Stormwater Department.

Policy D4.2 The City will continue perfecting the backflow prevention devices to replace the flap gates where Stormwater outfalls into surface waters.

Policy D4.3 The City will continue an ongoing maintenance program for lakes, creeks, canals and other Stormwater retention and conveyance features in a manner which protects the natural drainage features and adjacent natural resources.

OBJECTIVE D5: The City shall protect natural drainage features and sensitive environmental resources. The maintenance, upgrade and improvement of the municipal drainage system shall not encroach upon the environmentally sensitive areas designated by the City as “preservation”.

Policy D5.4 Coordination among local, regional, state and federal environmental regulation agencies will continue to be sought by St. Petersburg in relation to drainage improvements.

Policy D5.5 St. Petersburg will continue to seek permits from appropriate regional, state and federal agencies relating to dredge and fill, water quality, drainage system maintenance and other environmental issues.

AQUIFER RECHARGE SUBELEMENT

OBJECTIVE AR1: The City shall continue to implement current zoning and drainage ordinances thus, protecting and enhancing the functions of natural drainage features.

Policy AR1.2 The City will continue to maintain lakes, creeks, canals and other stormwater retention and conveyance features which protects natural drainage features (Drainage Element of the Comprehensive Plan).

INTERGOVERNMENTAL COORDINATION ELEMENT

OBJECTIVE CI2: The City will continue to implement existing procedures that require new development to bear a proportionate cost of facility improvement, necessitated by the development, to adequately maintain adopted LOS standards.

Policy CI2.1.3 Drainage 1. Due to the back-log of stormwater improvement needs and the time needed to implement improvements to the municipal system, existing conditions shall be adopted as the level of service; 2. Construction of new and improvements to existing surface water management systems require permits from SWFWMD, except for projects specifically exempt. As a condition of municipal development approval, new development and redevelopment within the City which requires a SWFWMD permit according to Rules 40-D-4 and 40-D-40 shall be required to obtain a SWFWMD permit and meet SWFWMD water quantity and quality design standards. Development which is exempt from SWFWMD permitting requirements shall be required to obtain a letter of exemption. 3. Construction of new and improvements to existing surface water management systems will be required to meet design standards outlined in the Drainage ordinance, Chapter 16.314, St. Petersburg City Code; using a minimum design storm of 10 year return frequency, 1 hour duration, rainfall intensity curve Zone VI, Florida Department of Transportation. Improvements to the Municipal Drainage System will be designed to convey the runoff from a 10-year 1 hour storm event.

OBJECTIVE CI3: The City shall protect vulnerable coastline and shall avoid property destruction and personal injury by limiting expenditures on public facilities in the designated coastal high hazard area except for purposes of conservation, stormwater management, natural resource protection and preservation, recreation, and improvement of hurricane evacuation system, and providing facilities necessary for the adopted land use.

Policy CI3.1 Expanded infrastructure in the coastal high hazard area shall only be permitted as necessary to protect the public health, welfare and safety, including stormwater and sewer improvements and to service the demand generated by the planned for development identified in the Future Land Use Plan (Coastal Management Element, Policy CM 10.4)

Policy CI3.2 The City shall not locate potable water line extensions in the coastal high hazard area, beyond what is necessary to service planned zoning densities (Coastal Management Element, Policy CM 10.6).

OBJECTIVE 11.3: CONSISTENCY REQUIREMENTS AND CONCURRENCY MANAGEMENT. As a requirement of Florida's Growth Management Legislation of 1985/86, two important issues must be addressed in the Comprehensive Plan -- consistency and concurrency. The local Comprehensive Plan must be consistent with both the Regional Policy Plan and the State Comprehensive Plan. In addition, the legislation also includes a concurrency requirement. Funding to meet the concurrency requirements of this legislation is the responsibility of the local government. Consistency and the development of a concurrency management system are more adequately explained in the following sections.

Policy 11.3.2.5 Minimum Requirements for Concurrency A concurrency management system shall be developed and adopted to ensure that public facilities and services needed to support development are available concurrent with the impacts of such developments. 3) For transportation facilities (roads and mass transit designated in the adopted City of St. Petersburg's Comprehensive Plan), at a minimum, the City of St. Petersburg shall meet the following standards to satisfy the concurrency requirement: f) For the purpose of issuing a development order or permit, a proposed development may be deemed to have a de minimis impact (an impact that would not affect more than 1 percent of the maximum volume at the adopted level of service of the affected transportation facility as determined by the City of St. Petersburg), and may not be subject to the concurrency requirements of Rule 9J-5.0055(3)(c) 1-4. No impact will be de minimis if it would exceed 110 percent of the sum of existing volumes and the projected volumes from approved projects on a transportation facility; provided however, that an impact of a single family home on an existing lot will constitute a de minimis impact on all roadways regardless of the level of the deficiency of the roadway. Further, no impact will be de minimis if it would exceed the adopted level of service standard of any affected designated hurricane evacuation routes.

OBJECTIVE IC1: Intergovernmental coordination should be expanded between the City, the Pinellas County School Board, various agencies and other units of local government that provide

services to the residents of the City to discuss future expansion plans and identify any proposed land use or facility impacts.

Policy IC1.10 The City will adopt LDRs to provide notice of proposed future land use plan policy amendments impacting hurricane shelter capacity and evacuation route clearance time, and land use map amendments resulting in an increase in population within the coastal high hazard zone to the TBRPC and Pinellas County Emergency Management Department.