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 Hillsborough 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 Hillsborough 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

Hillsborough 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 Hillsborough 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, tropical cyclone generated storm surge, and sinkholes. 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, 4,213 acres are susceptible to Category 1 storm surge (CHZ), 71,081 acres are susceptible to Category 1 – 3 storm surge (HVZ), 181,486 are susceptible to 100-year flood, 63,782 acres are susceptible to wildfire, and 95,374 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.

Storm Surge

Around 81% of the 4,213 vacant acres in the Coastal High Hazard Area and 81% of the 71,081 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 to limit population centers and public infrastructure, prohibit septic tanks for new development or solid waste and hazardous waste management sites, and floodproof existing water and wastewater facilities in the Coastal High Hazard Area (CHHA); impose density and intensity limitations in the CHHA during post-disaster redevelopment; require that proposed development not increase evacuation clearance time; and require mobile home parks to have on-site shelter.
- The Comprehensive Plan should continue to require new construction of utility lines to be placed underground; coordinate through the metropolitan transportation planning process to require transportation system management plans to evaluate the level of public expenditures that subsidize development in the CHHA; and other existing measures to reduce the risk from surge.
- 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 developing an inventory of transportation disadvantaged persons that would be affected by an evacuation order, and ensure the availability of adequate transportation for safe and timely evacuation of high risk areas.
- The County should consider prohibiting new schools in the CHHA and 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,
- to reduce residential and commercial development in surge prone areas
- The Comprehensive Plan should consider prohibiting the development of nursing homes, adult congregate living facilities, hospitals, mobile homes, county funded facilities, and other high-risk developments inside the CHHA. Building these facilities out of harm's way reduces risk to critical and essential government facilities, and lessens evacuation needs of the special needs population. In addition, the number of evacuees is reduced who are under medical supervision or need medical staff chaperones, potentially reducing hurricane evacuation clearance times.
- 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 54% of the 181,486 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 stormwater management, require freeboard for new/future development, retrofit

stormwater management facilities, protect the function of floodwater conveyance and water storage in natural areas, prohibit unmitigated encroachment in the 100-year floodplain of riverine systems, coordinate with the Southwest Florida Water Management District to review adequacy of current stormwater management design standards, encourage new developments to demonstrate cluster development to achieve open space to protect floodplains, require that new development be designed so that post-development stormwater runoff is similar or better than predevelopment, minimize filling low lying areas as a means of meeting minimum flood elevations, and other measures to reduce the risk from flood.

- The County 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 impose density and intensity limitations in 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; the current policy (Capital Improvement Element 1.C.1.b.(3.b) does not indicate a freeboard elevation). 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 prohibiting land filling which results in net loss of storage within in the 100-year floodplain.
- 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 developers incorporate wetland portions of sites within the 100-year floodplain as conservation easements.
- 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 63,782 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 86% of the 95,374 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 and providing for consideration of sinkhole risk in land suitability analyses through the review process of land development codes, including stormwater management measures; coordinate with the Southwest Florida Water Management District to provide technical expertise to the public with regard to sinkhole risks; requiring new development to 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

- 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 County 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, floods, wildfires, and sinkholes, and 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.

- Provide a clear description of geographic areas exposed to each of the hazards.
- Include data layers on hazard 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 loss estimates by land use.
- Include a quantitative risk assessment for critical facilities.
- 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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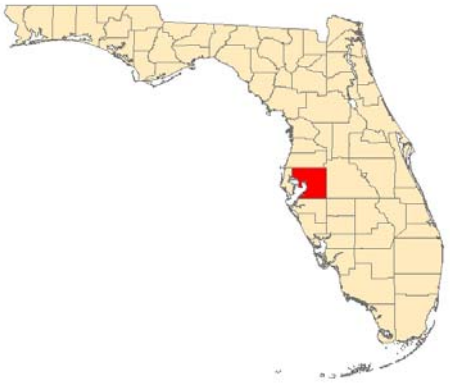
1. County Overview



Geography and Jurisdictions

Hillsborough County is located along the Gulf of Mexico in the western portion of the central Florida peninsula. It covers a total of 1,266.2 square miles, of which 1,050.9 square miles are land and 215.3 square miles are water. There are three incorporated municipalities within Hillsborough County, as shown in **Table 1.1**. The City of Tampa 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 Hillsborough County and the percent change from the 2000 U.S. Census are presented in **Table 1.1**. While some residents live in incorporated jurisdictions, nearly 66% live in unincorporated areas of the county. Hillsborough County has experienced significant population growth in recent years, a trend that is expected to continue. Between 1990 and 2000, Hillsborough County had a growth rate of 19.8%, which is slightly less than the statewide average of 23.5% for the same time period.

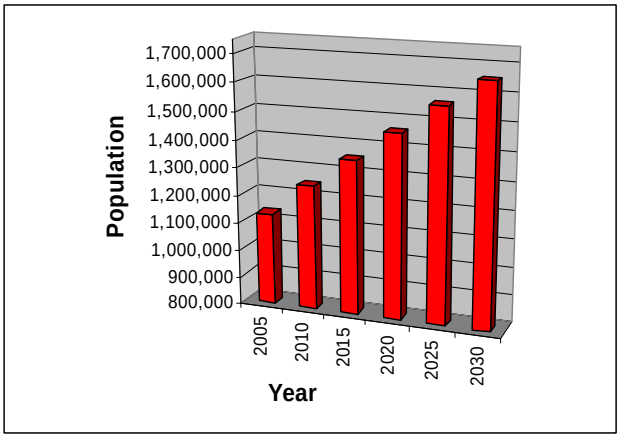
Table 1.1 Population Estimates by Jurisdiction

Jurisdiction	Population (Census 2000)	Population (Estimate 2004)	Percent Change 2000-2004	Percent of Total Population (2004)
Unincorporated	644,823	730,821	13.34%	65.93%
Plant City	29,760	32,002	7.53%	2.89%
Tampa	303,447	323,663	6.66%	29.20%
Temple Terrace	20,918	21,949	4.93%	1.98%
Total	**998,948**	**1,108,435**	**10.96%**	**100.00%**

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

According to BEBR (2004), Hillsborough County's population is projected to grow steadily and reach an estimated 1,653,800 by the year 2030, increasing the average population density of 1,055 to 1,574 persons per square mile. **Figure 1.1** illustrates medium growth population projections for Hillsborough County based on 2004 calculations.

Figure 1.1 Population Projections for Hillsborough County, 2005–2030



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

Of particular concern within Hillsborough 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 998,948 persons residing in Hillsborough County, 12% are listed as 65 years old or over, 21.5% are listed as having a disability, 12.5% are listed as below poverty, and 20.9% live in a home where the primary language is other than English.

2. Hazard Vulnerability

Hazards Identification

The highest risk hazards for Hillsborough County as identified in the County's Local Mitigation Strategy (LMS) are severe storms (including lightning, hail, wind and tornado hazards); hurricanes, tropical storms and storm surge; wildfire; and flooding. Sinkholes were discussed in the LMS, and the risk was considered to be moderate 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 Hillsborough County. Of the 998,948 (U.S. Census 2000) people that reside in Hillsborough County, 5.7% are exposed to storm surge, 25.5% are exposed to 100-year flooding, 45% are exposed to wildfire, and 36.5% are exposed to sinkholes. Of the 254,862 people exposed to flood, 31.9% are disabled and 18.9% are minorities.

Table 2.1 Estimated Number of Persons Exposed to Selected Hazards

Segment of Population	Storm Surge	Flood	Wildfire	Sinkhole
Total (all persons)*	**56,498**	**254,862**	**449,573**	**364,784**
Minority	9,507	48,109	106,340	103,720
Over 65	6,469	30,902	52,682	41,491
Disabled	16,079	81,290	155,865	140,257
Poverty	4,145	24,854	48,731	52,771
Language-Isolated	1,305	2,606	3,290	6,681
Single Parent	2,984	14,961	29,303	27,984

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 Hillsborough 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 Hillsborough 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 Hillsborough 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, Hillsborough County currently has a significant shelter deficit. According to Florida's Statewide Emergency Shelter Plan, Hillsborough County has an existing shelter capacity of 79,553 people. The 2004 shelter demand for a Category 4 or Category 5 hurricane is 134,705 people, leaving an existing shelter deficit of 55,152. In 2009, the projected shelter demand is 146,823, leaving an anticipated shelter deficit of 67,270.

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. Hillsborough 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 Hillsborough 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 Hillsborough 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	16,387	74,394	107,584	90,049
Mobile Home	574	40,976	14,761	2,313
Multi-Family	3,571	28,351	17,259	15,251
Commercial	1,806	16,459	9,759	7,134
Agriculture	232	10,806	5,549	3,713
Gov. / Institutional	507	2,109	5,670	2,120
Total	**23,077**	**173,095**	**160,582**	**120,580**

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 454,257 structures exposed to at least one of the four hazards, of which most are single-family homes in subdivisions. Of these structures, 38.1% are exposed to flood. Over 173,000 structures are located within the 100-year floodplain, of which 13.3% are exposed to storm surge induced flooding. Approximately 71% of the structures exposed to surge are single-family homes, and 15.5% 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 Alafia River and Tampa Bay. According to the latest National Flood Insurance Program Repetitive Loss Properties list, as of March 2005, there are 208 repetitive loss properties in unincorporated areas of Hillsborough 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 35%, or 160,582 structures are exposed to wildfire, of which 70% are single-family homes. There are 26.5% or 120,580 structures are located within sinkholes susceptible areas, of which nearly 75% 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. Hillsborough County future land use data was acquired in July 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 Hillsborough County future land use map dated July 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 Tampa and areas along Tampa Bay. The total amount of land in the CHZ is 41,376.5 acres. As shown in **Table 2.4**, 33% are used for residential single-family homes; 21% are parks, conservation areas and golf courses; 17% are used for government, institutional, hospitals or education purposes; and 10.2% are currently undeveloped. **Table 2.5** shows that of the 4,213.4 undeveloped acres, 19.8% are designated for residential-6 development. The County has taken favorable action in designating a portion of vacant acreage in the CHZ for low dwelling density.

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 communities of Tampa and Temple Terrace, but are also found along Tampa Bay. The total amount of land in the HVZ is 71,080.7 acres. As shown in **Table 2.4**, 37.9% are used for residential single-family homes; 17.4% are used for government, institutional, hospitals or education purposes; 13.5% are parks, conservation areas and golf courses; and 9.8% are currently undeveloped. **Table 2.5** shows that of the 6,999.6 undeveloped acres, 18.2% are designated for residential-6 development. The County has taken favorable action in designating a portion of vacant acreage in the HVZ for low dwelling density.

In **Attachment C**, two maps present the existing and future land uses within the 100-year flood zone. There are flood-prone areas scattered across the County. However, a majority of the large swaths surround Tampa bay and the many creeks, streams and tidal wetlands along the coastline. The total amount of land in the special flood hazard area is 181,486.3 acres. As shown in **Table 2.4**, 27.8% are parks, conservation areas and golf courses; 25.8 are used for residential single-family homes; 11.5% are in agricultural use; and 11.5% are currently undeveloped. **Table 2.5** shows that of the 20,895.7 undeveloped acres, 19% are designated for agriculture/mining use with one dwelling unit per 20 acres. The County has taken favorable action in designating a portion of vacant acreage in the 100-year flood zone for low dwelling density.

In **Attachment D**, two maps present the existing and future land uses within wildfire susceptible areas. These areas are scattered across the County. The total amount of land in the wildfire susceptible areas is 63,782.1 acres. As shown in **Table 2.4**, 41.5% are used for residential single-family homes; 12.3% are currently undeveloped; 10.2% are parks, conservation areas and golf courses; and 9.3% are used for agriculture. **Table 2.5** shows that of the 7,823.7 undeveloped acres, 22.4% are designated for residential-1 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 concentrated areas are scattered across the County, but are prevalent in areas

north of Tampa, in Temple Terrace, and in the western half of Plant City. The total amount of land in the sinkhole susceptible areas is 95,373.6 acres. As shown in **Table 2.4**, 45.8% are used for residential single-family homes; 12.2% are used for agriculture; 10.2% are currently undeveloped; and 7.6% are used for government, institutional, hospitals or education purposes. **Table 2.5** shows that of the 9,725.8 undeveloped acres, 28.8% are designated for residential-1 development. The County has the opportunity to review existing risk data and map included in the Hillsborough Comprehensive Plan (Plan) to further analyze sinkhole vulnerability for this land use category, and implement existing mitigation measures outlined in the Plan such as coordinating with the Southwest Florida Water Management District for technical expertise with sinkhole risks. The Plan indicates that the greatest potential sinkhole danger exists for large buildings and heavy equipment. The County has taken favorable action to reduce this type of damage by designating only 4.2% of sinkhole susceptible acres for commercial and industrial use.

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	1,431.7	2,285.9	20,928.7	5,923.2	11,629.8
	%	3.5	3.2	11.5	9.3	12.2
Attractions, Stadiums, Lodging	Acres	676.6	777.6	935.6	158.1	700.0
	%	1.6	1.1	0.5	0.2	0.7
Places of Worship	Acres	117.9	395.3	1,006.3	750.4	1,776.8
	%	0.3	0.6	0.6	1.2	1.9
Commercial	Acres	886.6	2,302.9	4,327.1	1,646.6	5,491.4
	%	2.1	3.2	2.4	2.6	5.8
Government, Institutional, Hospitals, Education	Acres	7,039.2	12,364.6	17,041.7	5,021.1	7,227.4
	%	17.0	17.4	9.4	7.9	7.6
Industrial	Acres	2,056.5	3,867.2	4,821.5	1,114.4	2,330.5
	%	5.0	5.4	2.7	1.7	2.4
Parks, Conservation Areas, Golf Courses	Acres	8,709.0	9,629.9	50,381.1	6,495.1	3,243.4
	%	21.0	13.5	27.8	10.2	3.4
Residential Group Quarters, Nursing Homes	Acres	428.9	749.5	3,761.5	1,193.3	2,095.1
	%	1.0	1.1	2.1	1.9	2.2
Residential Multi-Family	Acres	1,067.2	2,259.4	4,104.4	1,306.4	3,413.9
	%	2.6	3.2	2.3	2.0	3.6
Residential Mobile Home, or Commercial Parking Lot	Acres	505.4	1,532.2	3,996.0	5,522.4	3,161.8
	%	1.2	2.2	2.2	8.7	3.3
Residential Single-Family	Acres	13,658.5	26,936.4	46,791.0	26,442.4	43,645.9
	%	33.0	37.9	25.8	41.5	45.8
Submerged Land (Water Bodies)	Acres	2.9	2.7	137.5	7.8	117.7
	%	0.0	0.0	0.1	0.0	0.1
Transportation, Communication, Rights-Of-Way	Acres	326.6	529.2	523.7	134.4	236.5
	%	0.8	0.7	0.3	0.2	0.2
Utility Plants and Lines, Solid Waste Disposal	Acres	256.1	448.3	1,834.5	242.8	577.6
	%	0.6	0.6	1.0	0.4	0.6
Vacant	Acres	4,213.4	6,999.6	20,895.7	7,823.7	9,725.8
	%	10.2	9.8	11.5	12.3	10.2
Total Acres	**Acres**	**41,376.5**	**71,080.7**	**181,486.3**	**63,782.1**	**95,373.6**
	%	**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
Agricultural - 1 du/10 ac	Acres	0.0	0.0	0.0	0.0	2,520.7	286.7	443.4	33.0	141.1	24.5
	%	0.0	0.0	0.0	0.0	1.4	1.4	0.7	0.4	0.1	0.3
Agricultural Estate - 1 du/2.5 ac	Acres	0.0	0.0	0.0	0.0	2,094.9	414.0	1,441.7	148.0	836.4	139.1
	%	0.0	0.0	0.0	0.0	1.2	2.0	2.3	1.9	0.9	1.4
Agricultural/Mining - 1 du/ac20	Acres	0.0	0.0	0.0	0.0	14,838.4	3,970.6	2,981.9	717.2	790.3	16.3
	%	0.0	0.0	0.0	0.0	8.2	19.0	4.7	9.2	0.8	0.2
Agricultural/Rural - 1 du/ac5	Acres	4,508.1	235.9	6,100.5	364.9	18,338.9	1,979.2	4,354.9	433.8	4,015.2	624.9
	%	10.9	5.6	8.6	5.2	10.1	9.5	6.8	5.5	4.2	6.4
Central Business District	Acres	20.7	2.0	86.1	7.8	63.8	4.0	0.0	0.0	0.0	0.0
	%	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Commercial	Acres	0.0	0.0	0.0	0.0	23.4	11.1	68.4	24.3	325.3	47.5
	%	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.5
Community Mixed Use -12	Acres	105.9	0.4	3,683.7	833.1	1,668.0	292.3	1,145.6	199.5	1,199.1	171.0
	%	0.3	0.0	5.2	11.9	0.9	1.4	1.8	2.5	1.3	1.8
Community Mixed Use -35	Acres	122.2	10.7	373.6	23.0	218.5	19.8	9.6	1.3	645.2	63.8
	%	0.3	0.3	0.5	0.3	0.1	0.1	0.0	0.0	0.7	0.7
Downtown Core	Acres	0.0	0.0	0.0	0.0	0.7	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
Environmentally Sensitive Areas	Acres	337.3	34.6	315.9	31.0	4,754.9	367.8	291.4	34.1	489.8	6.9
	%	0.8	0.8	0.4	0.4	2.6	1.8	0.5	0.4	0.5	0.1
General Mixed Use-24	Acres	2.2	0.9	12.0	2.0	0.7	0.0	0.0	0.0	9.8	3.3
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Heavy Commercial - 24	Acres	30.3	3.8	179.5	16.9	50.2	7.8	35.4	10.9	935.9	87.8
	%	0.1	0.1	0.3	0.2	0.0	0.0	0.1	0.1	1.0	0.9
Heavy Industrial	Acres	5,032.0	523.0	5,420.5	553.5	5,301.5	591.7	947.5	135.3	300.7	21.6
	%	12.2	12.4	7.6	7.9	2.9	2.8	1.5	1.7	0.3	0.2
Industrial	Acres	0.0	0.0	0.0	0.0	85.6	15.2	258.4	24.3	53.7	22.5
	%	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.3	0.1	0.2
Light Industrial	Acres	3,440.0	489.3	4,861.4	879.5	4,344.2	794.7	1,340.9	243.0	2,035.6	277.3
	%	8.3	11.6	6.8	12.6	2.4	3.8	2.1	3.1	2.1	2.9
Light Industrial - Planned	Acres	141.6	11.1	1,060.5	91.6	473.7	296.7	210.4	24.1	193.7	3.8
	%	0.3	0.3	1.5	1.3	0.3	1.4	0.3	0.3	0.2	0.0
MacDill AFB	Acres	3,589.6	0.0	5,488.8	4.9	4,718.1	0.9	0.0	0.0	776.9	0.0
	%	8.7	0.0	7.7	0.1	2.6	0.0	0.0	0.0	0.8	0.0
Municipal Airport Compatibility	Acres	164.7	34.6	306.3	57.3	295.8	49.9	0.0	0.0	0.0	0.0
	%	0.4	0.8	0.4	0.8	0.2	0.2	0.0	0.0	0.0	0.0
Natural Preservation	Acres	6,380.0	392.4	7,120.4	411.5	40,966.5	1,025.9	4,262.4	254.4	1,881.1	1.3
	%	15.4	9.3	10.0	5.9	22.6	4.9	6.7	3.3	2.0	0.0
Neighborhood Mixed Use - 4	Acres	0.0	0.0	35.9	0.2	661.0	28.5	298.5	9.8	351.3	56.8
	%	0.0	0.0	0.1	0.0	0.4	0.1	0.5	0.1	0.4	0.6

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
No Data	Acres	0.0	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	0.0	0.0	0.0	0.0
No Data/Not in Jurisdiction	Acres	0.0	0.0	4.7	0.0	9.6	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
Office Commercial	Acres	531.7	129.5	1,013.4	222.5	1,065.6	206.9	277.3	60.2	2,547.0	272.4
	%	1.3	3.1	1.4	3.2	0.6	1.0	0.4	0.8	2.7	2.8
Office/Institutional	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.2	3.8
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Park/Recreation/Open Space	Acres	0.0	0.0	26.5	0.7	165.4	0.7	0.4	0.0	272.2	1.6
	%	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0
Public/Quasi-Public	Acres	978.7	27.9	2,907.9	67.3	4,027.7	95.0	2,675.6	50.2	2,935.5	144.5
	%	2.4	0.7	4.1	1.0	2.2	0.5	4.2	0.6	3.1	1.5
Public/Semi-Public	Acres	0.0	0.0	14.9	0.0	1.1	0.0	34.3	0.0	233.0	0.4
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0
Recreation/Open Space	Acres	306.3	0.0	489.1	2.2	532.6	0.0	307.9	2.5	746.6	0.0
	%	0.7	0.0	0.7	0.0	0.3	0.0	0.5	0.0	0.8	0.0
Regional Mixed Use - 100	Acres	212.0	15.2	438.1	25.9	378.8	35.4	0.2	0.0	92.7	10.7
	%	0.5	0.4	0.6	0.4	0.2	0.2	0.0	0.0	0.1	0.1
Regional Mixed Use - 35	Acres	0.0	0.0	0.0	0.0	527.2	74.2	121.7	28.1	101.4	22.1
	%	0.0	0.0	0.0	0.0	0.3	0.4	0.2	0.4	0.1	0.2
Research/Corporate Park	Acres	106.1	1.3	167.4	9.1	200.2	80.7	80.3	21.6	368.3	150.9
	%	0.3	0.0	0.2	0.1	0.1	0.4	0.1	0.3	0.4	1.6
Residential -3	Acres	0.0	0.0	0.0	0.0	118.6	19.4	86.3	24.1	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.0	0.0
Residential -9	Acres	684.2	82.9	2,013.7	252.6	1,721.0	282.2	1,566.5	183.5	3,223.1	277.8
	%	1.7	2.0	2.8	3.6	0.9	1.4	2.5	2.3	3.4	2.9
Residential -1	Acres	1,575.2	141.8	2,503.3	242.1	20,518.5	2,761.2	13,520.0	1,754.9	23,536.1	2,805.1
	%	3.8	3.4	3.5	3.5	11.3	13.2	21.2	22.4	24.7	28.8
Residential -10	Acres	743.5	82.0	2,777.9	176.6	2,016.0	159.8	43.2	2.2	4,877.0	186.1
	%	1.8	1.9	3.9	2.5	1.1	0.8	0.1	0.0	5.1	1.9
Residential -12	Acres	658.3	130.4	944.1	167.9	1,245.3	250.8	690.4	101.4	1,893.1	164.3
	%	1.6	3.1	1.3	2.4	0.7	1.2	1.1	1.3	2.0	1.7
Residential -18	Acres	0.0	0.0	15.6	0.0	104.1	0.4	7.1	1.3	233.6	14.3
	%	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1
Residential -2	Acres	392.8	4.0	732.5	18.7	3,677.7	663.7	2,279.5	235.4	2,240.2	252.8
	%	0.9	0.1	1.0	0.3	2.0	3.2	3.6	3.0	2.3	2.6
Residential -20	Acres	427.4	24.1	933.4	67.3	1,045.3	85.8	356.0	44.8	3,303.6	337.5
	%	1.0	0.6	1.3	1.0	0.6	0.4	0.6	0.6	3.5	3.5
Residential -35	Acres	332.4	3.6	531.5	14.9	414.6	11.8	3.6	0.0	616.2	44.8
	%	0.8	0.1	0.7	0.2	0.2	0.1	0.0	0.0	0.6	0.5

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 -4	Acres	3,698.2	773.1	0.0	0.0	12,120.5	1,795.3	11,678.9	1,499.2	17,997.6	1,654.4
	%	8.9	18.3	0.0	0.0	6.7	8.6	18.3	19.2	18.9	17.0
Residential -50	Acres	12.3	0.9	29.6	2.0	12.5	1.1	0.0	0.0	49.3	0.7
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Residential -6	Acres	4,624.2	835.1	9,926.6	1,277.4	9,852.4	1,428.3	5,228.6	581.8	7,824.6	695.8
	%	11.2	19.8	14.0	18.2	5.4	6.8	8.2	7.4	8.2	7.2
Residential -83	Acres	1.8	0.0	18.1	2.5	7.6	2.9	0.0	0.0	7.4	2.5
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Residential Planned - 2	Acres	25.9	0.0	106.6	1.8	2,429.7	384.8	2,548.8	259.0	1,005.6	348.0
	%	0.1	0.0	0.1	0.0	1.3	1.8	4.0	3.3	1.1	3.6
Rights-Of-Way	Acres	117.3	4.7	2,685.6	198.6	206.7	12.3	22.1	5.8	91.2	6.7
	%	0.3	0.1	3.8	2.8	0.1	0.1	0.0	0.1	0.1	0.1
Suburban Mixed Use -3	Acres	0.0	0.0	0.0	0.0	404.2	30.1	235.6	30.3	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.4	0.0	0.0
Suburban Mixed Use -6	Acres	676.1	106.6	4,692.7	627.5	4,293.4	613.3	2,374.0	393.2	1,286.8	109.5
	%	1.6	2.5	6.6	9.0	2.4	2.9	3.7	5.0	1.3	1.1
Transitional Use - 24	Acres	79.4	18.7	128.9	33.7	130.2	28.3	19.8	4.9	102.3	7.4
	%	0.2	0.4	0.2	0.5	0.1	0.1	0.0	0.1	0.1	0.1
Unknown	Acres	0.0	0.0	0.0	0.0	0.0	0.0	30.3	4.9	52.6	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Urban Mixed Use -20	Acres	0.0	0.0	488.4	30.8	1,464.0	181.5	695.1	129.3	769.3	78.2
	%	0.0	0.0	0.7	0.4	0.8	0.9	1.1	1.7	0.8	0.8
Urban Mixed Use -60	Acres	80.0	5.8	291.1	19.2	220.0	9.1	0.0	0.0	406.8	5.6
	%	0.2	0.1	0.4	0.3	0.1	0.0	0.0	0.0	0.4	0.1
Water	Acres	1,238.2	87.2	2,153.7	261.1	11,155.6	1,523.7	807.7	111.9	3,552.2	559.6
	%	3.0	2.1	3.0	3.7	6.1	7.3	1.3	1.4	3.7	5.8
Total Acres	**Acres**	**41,376.5**	**4,213.4**	**71,080.6**	**6,999.6**	**181,486.2**	**20,895.7**	**63,782.1**	**7,823.7**	**95,373.7**	**9,725.8**
	%	**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 Hillsborough County's three 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 Tampa is the only municipality with any acreage in the Coastal Hazards Zone. The City of Tampa has the most acres in the HVZ but Temple Terrace has the largest proportion of HVZ acres out of its vacant land area. The City of Tampa has the most acres in the flood zone but Plant City has the largest proportion of flood zone acres out of its vacant land area. The City of Tampa has the most acres in the wildfire susceptible areas, as well as the largest proportion of

wildfire susceptible acres out of its vacant land area. The City of Tampa has the most acres in sinkhole susceptible areas, but Plant City has 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 Hillsborough 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
Plant City	Acres	0.0	0.0	0.0	0.0	538.6	142.7	1,484.9	191.5	1,441.9	285.6
	%	0.0	0.0	0.0	0.0	100.0	26.5	100.0	12.9	100.0	19.8
Tampa	Acres	10,015.8	522.8	20,205.9	1,065.6	21,221.4	1,510.8	1,751.6	301.8	13,409.7	607.3
	%	100.0	5.2	100.0	5.3	100.0	7.1	100.0	17.2	100.0	4.5
Temple Terrace	Acres	0.0	0.0	154.9	13.8	538.4	109.7	121.5	9.6	2,241.8	195.3
	%	0.0	0.0	100.0	8.9	100.0	20.4	100.0	7.9	100.0	8.7
Total Municipal Acres	**Acres**	**10,015.8**	**522.8**	**20,360.9**	**1,079.4**	**22,298.3**	**1,763.2**	**3,358.0**	**502.9**	**17,093.4**	**1,088.1**
	%	**100.0**	**5.2**	**100.0**	**5.3**	**100.0**	**7.9**	**100.0**	**15.0**	**100.0**	**6.4**

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 Hillsborough County LMS (adopted in 2004) 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 (Sections III and IV).

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 all hazards.
- Provides a hazards analysis and a qualitative vulnerability assessment.
- Includes maps for each of the hazards.
- Provides information regarding repetitive loss properties.
- Provides a list and maps of critical facilities.
- Includes a qualitative risk assessment for each hazard (Table 13. Hazards Vulnerability Analysis Matrix).
- Includes a future land use map.

Weaknesses:

- Does not provide a clear description of geographic areas exposed to each of the hazards.
- 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 loss estimates by land use.
- Does not include a quantitative risk assessment for critical facilities.

- 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 Hillsborough County LMS Guiding Principles section, called Evaluation of Existing Programs and Policies, contains a list of policies for the county and each municipality. **Appendix B** in the Hillsborough County LMS includes the ordinance, program or plan; description (in relation to hazard mitigation; and a review of effectiveness and evaluation. The 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 Hillsborough County LMS has a goal and objectives that support mitigation principles that are found in the comprehensive plan. A list of the LMS goal and objectives pertaining to comprehensive planning can be found in **Attachment F**. The following is a summary of the LMS goal and objectives that support comprehensive plan GOPs.

Hillsborough County's overall goal is to minimize the effects of any potential natural or man-made disasters on our community and its infrastructure. This goal is supported by four objectives. Objective 1, which emphasizes public education, aims to increase public awareness in the use of mitigation programs and techniques to reduce the impacts of natural and man-made hazards. Objective 2 strives to coordinate public and private sector participation in identifying and managing and/or implementing mitigation projects and measures throughout Hillsborough County. Objective 3 seeks to identify and implement a combination of regulatory, incentive and initiative programs that will reduce potential loss and would encourage participation in ongoing hazard mitigation. Objective 4, which focuses on critical facilities, hopes to develop and maintain an inventory management system on all data affecting hazard mitigation.

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 Hillsborough County adopting and implementing corresponding policies that are legally enforceable.

Comprehensive Emergency Operations Plan (CEMP)

The Hillsborough County CEMP references the LMS in the Recovery section. The CEMP notes that all pre-disaster mitigation 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 and the expertise of the Hazard Mitigation Section under the County Planning and Growth Management Department as well as County Emergency Management staff. 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, as well as pre-disaster mitigation programs such as the National Flood Insurance Program, Community Rating System and Flood Mitigation Assistance Program.

Though the identification of mitigation opportunities lies predominately with LMS Committee, the document lists numerous activities and supporting agencies to assist in supporting mitigation in

the County. Post-disaster mitigation assessment teams are comprised of representatives from public works, water department, parks and recreation, and facilities management departments. Municipalities are expected to provide damage assessments for their respective jurisdictions to the County for incorporation into the process to update LMS strategies and priorities. The Hillsborough County City-County Planning Commission (HCCCPC) is responsible for assuring that hazard mitigation considerations are addressed in the comprehensive planning process regarding land use. The County's Development Services Division will help ensure that local mitigation goals are met when addressing regular and emergency building permits. Hillsborough County has established a public outreach program which includes all jurisdictions to inform residents about hazards, insurance, and safety precautions.

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

National Flood Insurance Program/Community Rating System

Hillsborough County and all of its municipalities participate in the National Flood Insurance Program (NFIP). Hillsborough County as well as the municipalities of Tampa and Temple Terrace also participates in the NFIP Community Rating System (CRS). Hillsborough County currently has a CRS rating of 6, Tampa has a CRS rating of 7, and Temple Terrace has a CRS rating of 8. The municipality of Plant City does not currently participate in the CRS program.

4. Comprehensive Plan Review

Purpose and Intent

The Hillsborough County Comprehensive Plan (adopted March 1, 1999) was reviewed for the purpose of developing this profile. This review was undertaken in order to assess what steps Hillsborough 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 Hillsborough County as identified in the County's Local Mitigation Strategy (LMS) are severe storms (including lightning, hail, wind and tornado hazards); hurricanes, tropical storms and storm surge; wildfire; and flooding. Sinkholes were determined to be a moderate risk in the LMS. However, because the Comprehensive Plan included a sinkhole risk map and a number of objectives and policies related to sinkhole hazard mitigation, this warrants discussion of those policies in this assessment.

Hillsborough County is a coastal county, so policies in the Coastal Management Element are geared toward managing development and populations inside surge-prone areas. Policies relating to hazard mitigation within the Plan include those relating to flooding, stormwater control and protection, and surge mitigation. There were no policies in the Plan that focused on wildfire mitigation and protection measures.

The Hillsborough County Comprehensive Plan also focuses on the protection of natural features such as floodplains, sinkholes, and wetlands through development controls and stormwater management. The Plan supports a surface management strategy that relies on the function of natural features and natural systems to receive and otherwise manage storm and surface waters.

Storm Surge, Evacuation and Sheltering

Hillsborough County has several policies dedicated to sheltering. Policy 11.2 of the Coastal Management Element established a level of service standard of twenty (20) square feet of shelter space per person. Policy 11.4 requires developments within the hurricane vulnerability zone to evaluate the impact the additional traffic will have on hurricane evacuation times. In addition, Policy 11.7 requires new mobile home parks to designate a building for use as shelter space and requiring the County Land Development Regulations to establish standards for shelter buildings.

According to Florida's Statewide Emergency Shelter Plan, Hillsborough County had a shelter deficit of 55,152 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.

Additional storm surge mitigation measures include: limitations to residential population centers inside the Coastal High Hazard Area (CHHA) (Objective 6 CME); protecting coastal development and loss of life and property by minimizing development in the CHHA (Objective 5 CIE); and limitations of public expenditures for infrastructure in CHHA (Objective 10 CME and policies following).

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 several policies directed at minimizing flooding and stormwater runoff, and protecting flood prone areas from potential development impacts. The Plan incorporates development controls in place to minimize the impact of new development within the 100-year floodplain which include: the protection of natural functions and values of riverine corridors and the 100-year floodplain by preventing the net loss of 100-year floodplain storage volume (Objective 5 Conservation and Aquifer Recharge Element (CARE). In addition, unmitigated encroachment into the 100-year floodplain is prohibited by Policy 5.2 of the CARE.

The mitigation of flood waters through stormwater quantity levels are addressed in the Capital Improvements Element. This element includes varying level of service standards including target levels for all major stormwater conveyance systems (Policy 1.C.1.b (3.b), levels for those systems discharging into a City of Tampa system (Policy 1.C.1.b(3.c.), and specific levels for those areas that have a stormwater master plan (Policy 1.C.1.b(3.d). Policy 1.D.2.a mandates all capital improvements inside a CHHA are subject to limits and conditions of the Coastal Management Element.

Wildfire

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

Sinkholes

Although the LMS considers sinkholes a moderate risk to Hillsborough County, the Hillsborough County Comprehensive Plan identifies sinkhole prone areas on Figure 8 of the Conservation and Aquifer Recharge Element, the "Areas of Observed and Potential Sinkhole Development" map. This map indicates areas of sinkhole formations, and areas of probable sinkhole formations mainly in the north-central portion of the county. This map depicts a smaller geographic area of sinkhole susceptible areas than the map created for this profile, which is found in **Attachment E**.

The Conservation and Aquifer Recharge Element includes policies to protect the public from sinkhole hazards by publishing sinkhole data and providing information on sinkhole risks inside the land suitability analysis of the Plan (Policy 2.8 and 2.9 CARE). In addition, intergovernmental coordination with the Southwest Florida Water Management District is encouraged in Policy 2.10 with regard to providing technical expertise with sinkhole risks.

5. Municipal Case Study – City of Tampa

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

Hazards Analysis

The following analysis examines four hazard types: surge from tropical cyclones, flood, wildfire, and sinkholes. However, information regarding population or structure exposure to flood, wildfire and sinkhole hazards was not available at the time of this writing. Thus, only the storm surge hazard is analyzed for the existing exposed population and structures. 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 Tampa that is exposed to storm surge, as well as a breakdown of the sensitive needs population exposure.

Of the 303,447 (U.S. Census 2000) people that reside in the City of Tampa, 5.1% are exposed to storm surge. Of the 15,572 people exposed to storm surge, 23.7% are disabled and 14.4% are over age 65.

Table 5.1 Estimated Number of Persons Exposed to Hazards in Tampa

Segment of Population	Storm Surge
Total (all persons)*	**15,572**
Minority	1,884
Over 65	2,250
Disabled	3,683
Poverty	668
Language-Isolated	947
Single Parent	592

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.

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 Tampa by occupancy type that are exposed to storm surge. The estimated exposure of Tampa existing structures to the storm surge was determined through MEMPHIS.

There are 7,335 structures exposed to storm surge, of which most are single-family homes in subdivisions. As of March 2005, there are 207 repetitive loss properties in Tampa.

Table 5.2 Estimated Number of Structures Exposed to Hazards in Tampa

Occupancy Type	Storm Surge
Single Family	4,704
Mobile Home	12
Multi-Family	1,418
Commercial	902
Agriculture	91
Gov. / Institutional	208
Total	**7,335**

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, sinkholes, 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. Tampa's future land use data was acquired in September 2005 from the City of Tampa 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 Tampa future land use map dated September 2005. 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 Tampa Bay. The total amount of land in the CHZ is 9,883.4 acres. As shown in **Table 5.2**, 58.1% are used for government, institutional, hospitals or education purposes; 13.6% are used for residential single-family homes; 8.4% are used for industrial purposes; and 5.1% are currently undeveloped. **Table 5.3** shows that of the 502.7 undeveloped acres, 37.4% are designated for heavy industrial use. The City has the opportunity to implement mitigation measures such as

elevating structures above the NFIP "V" and "Coastal A" zone requirements and working with local industries to reduce vulnerability to their structures and economic impacts resulting from storm surge damage.

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 28% of the City of Tampa is located within the HVZ, predominantly along Tampa Bay and its tributaries. The total amount of land in the HVZ is 19,981.3 acres. As shown in **Table 5.2**, 46.7% are used for government, institutional, hospitals or education purposes; 24.9% are used for residential single-family homes; 7.3% are used for industrial purposes; and 5.7% are used for commercial purposes. **Table 5.3** shows that of the 1,060.9 undeveloped acres, 25.8% are designated for heavy industrial use. The City has the opportunity to implement mitigation measures such as elevating structures above the NFIP "A" and "V" zone requirements and working with local industries to reduce vulnerability to their structures and economic impacts resulting from storm surge damage.

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. However, a majority of the large swaths surround the many creeks, streams and tidal wetlands along Tampa Bay and its tributaries. The total amount of land in the special flood hazard area is 20,385 acres. As shown in **Table 5.2**, 38.5% are used for government, institutional, hospitals or education purposes; 24.3% are used for residential single-family homes; 8.6% are used for industrial purposes; and 6.9% are currently undeveloped. **Table 5.3** shows that of the 1,415.4 undeveloped acres, 24.7% are designated for environmentally sensitive areas. The City has taken favorable action in designating nearly 25% of vacant acreage as environmentally sensitive areas, which have development restrictions.

In **Attachment D**, two maps present the existing and future land uses within wildfire susceptible areas. These areas are primarily located in the northwest portion of the City. The total amount of land in the wildfire susceptible areas is 1,714.1 acres. As shown in **Table 5.2**, 30.1% are used for residential single-family homes; 29.3% are used for government, institutional, hospitals or education purposes; 17.9% are currently undeveloped; and 8.4% are residential group quarters and nursing homes. **Table 5.3** shows that of the 307.2 undeveloped acres, 31.6% are designated for suburban mixed use. The City has the opportunity to regulate design so that it will not increase the City's vulnerability to wildfire.

In **Attachment E**, two maps present the existing and future land uses within sinkhole susceptible areas. These areas are scattered across the central and northern portions of the City. The total amount of land in the sinkhole susceptible areas is 13,253.9 acres. As shown in **Table 5.2**, 48% are used for residential single-family homes; 21% are used for government, institutional, hospitals or education purposes; 9.4% are used for commercial purposes; and 4.3% are used for residential multi-family homes. **Table 5.3** shows that of the 550.9 undeveloped acres, 30.5% are designated for residential-10 development and 30.6% are designated for commercial or industrial use. The City has the opportunity to implement existing Comprehensive Plan policies to reduce damage to residential developments and large industrial buildings and heavy equipment, such as performing sub-surface soil investigations during the land development review process.

Table 5.2 Total Incorporated Tampa 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	0.0	3.8	3.6	1.1	0.7
	%	0.0	0.0	0.0	0.1	0.0
Attractions, Stadiums, Lodging	Acres	52.6	110.6	116.4	0.0	437.6
	%	0.5	0.6	0.6	0.0	3.3
Places of Worship	Acres	35.4	169.7	94.3	6.2	234.5
	%	0.4	0.8	0.5	0.4	1.8
Commercial	Acres	378.3	1,142.5	752.8	29.4	1,239.7
	%	3.8	5.7	3.7	1.7	9.4
Government, Institutional, Hospitals, Education	Acres	5,740.4	9,340.8	7,849.1	502.3	2,783.5
	%	58.1	46.7	38.5	29.3	21.0
Industrial	Acres	833.5	1,449.7	1,747.3	12.9	529.7
	%	8.4	7.3	8.6	0.8	4.0
Parks, Conservation Areas, Golf Courses	Acres	319.9	377.6	1,176.4	124.6	72.0
	%	3.2	1.9	5.8	7.3	0.5
Residential Group Quarters, Nursing Homes	Acres	63.5	136.0	494.0	143.3	231.0
	%	0.6	0.7	2.4	8.4	1.7
Residential Multi-Family	Acres	333.3	585.6	685.7	21.8	569.8
	%	3.4	2.9	3.4	1.3	4.3
Residential Mobile Home, or Commercial Parking Lot	Acres	26.8	211.8	85.6	1.1	147.1
	%	0.3	1.1	0.4	0.1	1.1
Residential Single-Family	Acres	1,348.7	4,977.8	4,961.5	515.6	6,362.9
	%	13.6	24.9	24.3	30.1	48.0
Submerged Land (Water Bodies)	Acres	2.9	2.7	3.1	0.0	1.3
	%	0.0	0.0	0.0	0.0	0.0
Transportation, Communication, Rights-Of-Way	Acres	170.3	294.5	243.0	12.9	34.3
	%	1.7	1.5	1.2	0.8	0.3
Utility Plants and Lines, Solid Waste Disposal	Acres	75.1	117.3	756.8	35.7	58.9
	%	0.8	0.6	3.7	2.1	0.4
Vacant	Acres	502.7	1,060.9	1,415.4	307.2	550.9
	%	5.1	5.3	6.9	17.9	4.2
Total Acres	**Acres**	**9,883.4**	**19,981.3**	**20,385.0**	**1,714.1**	**13,253.9**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Department of Community Affairs

Table 5.3 Total Incorporated Tampa 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	22.3	2.5	131.5	12.7	67.5	4.5	0.0	0.0	0.0	0.0
	%	0.2	0.5	0.7	1.2	0.3	0.3	0.0	0.0	0.0	0.0
Community Mixed Use -35	Acres	113.5	9.4	488.0	38.6	208.4	18.5	8.5	0.7	647.2	62.4
	%	1.1	1.9	2.4	3.6	1.0	1.3	0.5	0.2	4.9	11.3
Environmentally Sensitive Areas	Acres	331.9	30.5	332.6	33.2	4,528.2	349.8	268.0	32.8	481.5	6.5
	%	3.4	6.1	1.7	3.1	22.2	24.7	15.6	10.7	3.6	1.2
General Mixed Use-24	Acres	1.3	0.7	18.7	4.7	1.6	0.0	0.0	0.0	8.7	3.8
	%	0.0	0.1	0.1	0.4	0.0	0.0	0.0	0.0	0.1	0.7
Heavy Commercial -24	Acres	27.9	3.1	214.7	23.4	56.4	8.5	37.0	10.0	934.3	87.2
	%	0.3	0.6	1.1	2.2	0.3	0.6	2.2	3.3	7.0	15.8
Heavy Industrial	Acres	1,972.7	188.2	2,528.7	274.2	2,123.2	198.9	88.1	57.1	294.7	17.6
	%	20.0	37.4	12.7	25.8	10.4	14.1	5.1	18.6	2.2	3.2
Light Industrial	Acres	336.8	68.2	673.9	174.8	455.7	148.9	63.8	38.8	585.9	53.9
	%	3.4	13.6	3.4	16.5	2.2	10.5	3.7	12.6	4.4	9.8
MacDill AFB	Acres	3,597.0	0.0	5,528.9	0.7	4,720.1	0.7	0.0	0.0	777.6	0.0
	%	36.4	0.0	27.7	0.1	23.2	0.0	0.0	0.0	5.9	0.0
Municipal Airport Compatibility	Acres	164.1	28.8	362.0	62.6	296.9	50.2	0.0	0.0	0.0	0.0
	%	1.7	5.7	1.8	5.9	1.5	3.5	0.0	0.0	0.0	0.0
Public/Quasi-Public	Acres	647.8	10.9	1,647.7	9.6	875.0	11.4	232.7	0.0	1,339.1	0.2
	%	6.6	2.2	8.2	0.9	4.3	0.8	13.6	0.0	10.1	0.0
Recreation/Open Space	Acres	292.7	0.0	505.6	0.0	520.1	0.0	179.0	0.0	718.9	0.0
	%	3.0	0.0	2.5	0.0	2.6	0.0	10.4	0.0	5.4	0.0
Regional Mixed Use -100	Acres	210.7	19.6	523.4	38.6	374.1	37.5	0.2	0.0	92.1	10.3
	%	2.1	3.9	2.6	3.6	1.8	2.6	0.0	0.0	0.7	1.9
Residential -3	Acres	0.0	0.0	0.0	0.0	120.4	20.1	85.8	25.6	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.6	1.4	5.0	8.3	0.0	0.0
Residential -10	Acres	737.7	82.7	3,789.1	228.7	2,027.3	160.5	37.9	3.6	4,796.3	168.1
	%	7.5	16.5	19.0	21.6	9.9	11.3	2.2	1.2	36.2	30.5
Residential -20	Acres	147.8	12.9	517.9	32.3	246.1	17.4	71.3	7.6	764.6	66.9
	%	1.5	2.6	2.6	3.0	1.2	1.2	4.2	2.5	5.8	12.1
Residential -35	Acres	340.6	2.2	620.4	17.4	421.6	10.9	3.6	0.0	622.2	45.5
	%	3.4	0.4	3.1	1.6	2.1	0.8	0.2	0.0	4.7	8.3
Residential -50	Acres	12.0	0.7	42.4	4.7	12.7	1.1	0.0	0.0	48.8	0.4
	%	0.1	0.1	0.2	0.4	0.1	0.1	0.0	0.0	0.4	0.1
Residential -6	Acres	642.5	14.7	1,313.9	31.2	1,197.4	31.9	4.0	0.0	194.4	2.2
	%	6.5	2.9	6.6	2.9	5.9	2.3	0.2	0.0	1.5	0.4
Residential -83	Acres	1.6	0.2	19.8	4.9	8.2	3.3	0.0	0.0	7.6	2.0
	%	0.0	0.0	0.1	0.5	0.0	0.2	0.0	0.0	0.1	0.4
Rights-Of-Way	Acres	118.6	4.0	227.6	6.5	201.8	14.7	19.2	5.6	67.3	4.5
	%	1.2	0.8	1.1	0.6	1.0	1.0	1.1	1.8	0.5	0.8
Suburban Mixed Use -3	Acres	0.0	0.0	0.0	0.0	305.4	20.1	173.4	23.2	0.0	0.0
	%	0.0	0.0	0.0	0.0	1.5	1.4	10.1	7.6	0.0	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
Suburban Mixed Use -6	Acres	1.8	0.0	2.5	0.0	1,256.4	269.3	421.1	97.2	361.8	5.1
	%	0.0	0.0	0.0	0.0	6.2	19.0	24.6	31.6	2.7	0.9
Transitional Use-24	Acres	75.8	16.7	156.5	43.7	128.0	30.8	20.7	5.1	103.2	8.9
	%	0.8	3.3	0.8	4.1	0.6	2.2	1.2	1.7	0.8	1.6
Urban Mixed Use -60	Acres	84.7	6.7	334.2	18.5	212.7	6.7	0.0	0.0	407.1	5.3
	%	0.9	1.3	1.7	1.7	1.0	0.5	0.0	0.0	3.1	1.0
Water	Acres	1.8	0.0	1.1	0.0	20.1	0.0	0.0	0.0	0.4	0.0
	%	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Acres	**Acres**	**9,883.6**	**502.7**	**19,981.2**	**1,060.9**	**20,385.2**	**1,415.4**	**1,714.3**	**307.2**	**13,253.9**	**550.9**
	%	**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 Hillsborough County LMS was developed by the County and all of its incorporated municipalities. All entities collaborated to develop unified community-wide goals and objectives, many of which pertain to comprehensive planning. The list of County LMS goals and objectives are listed in Section 3 Existing Mitigation Measures in the Local Mitigation Strategy Assessment in the Countywide Hazards Profile that precedes the Tampa Municipal Case Study. The Hillsborough County LMS includes few municipal-level hazard mitigation initiatives (predominately countywide), though the City of Tampa has adopted its designated portion of the LMS and will continue participating in the updating and expansion of the LMS as necessary. One identifiable local initiative in the LMS is the basement waterproofing at the Tampa Theater. Tampa participates in the National Flood Insurance Program (NFIP) and currently has a rating Community Rating System (CRS) rating of seven (7).

Comprehensive Plan Review

Purpose and Intent

The City of Tampa Comprehensive Plan (adopted January 29, 1998) was reviewed for the purpose of developing this profile. This review was undertaken in order to assess what steps the City of Tampa has taken to integrate hazard mitigation initiatives from the County 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 Hillsborough County as identified in the County's Local Mitigation Strategy (LMS) are severe storms (including lightning, hail, wind and tornado hazards);

hurricanes, tropical storms and storm surge; wildfire; and flooding. Sinkholes were determined to be a moderate risk in the LMS. However, because the Comprehensive Plan included a number of policies related to sinkhole hazard mitigation, a discussion is warranted of those policies in this assessment.

The City of Tampa is located at the coast, so policies in the Coastal Management Element are geared toward managing development and populations inside surge-prone areas. Policies relating to hazard mitigation within the Plan include those relating to flooding, stormwater control and protection, and surge mitigation. There were no policies in the Plan focused on wildfire mitigation and protection measures.

The City of Tampa Comprehensive Plan also focuses on the protection of natural features such as floodplains, sinkholes, and wetlands through development controls and stormwater management. The Plan supports a surface management strategy that relies on the function of natural features and natural systems to receive and otherwise manage storm and surface waters.

Storm Surge, Evacuation and Sheltering

The City of Tampa has several policies dedicated to sheltering. Policy 4.2 of the Coastal Management Element requires the City to monitor shelter capacity. Policy 4.3 provides for public notification of shelter locations for those within the Coastal High Hazard Area (CHHA). As with Hillsborough County, the City has a shelter level of service standard of twenty (20) square feet per person, and requires continued identification of new potential shelters in Policy 8.2 of the Coastal Management Element. Importantly, the City in Policy 8.6 of the CME assesses the effect on evacuation clearance times and number of persons requiring public shelter to the development review process for the issuance of building permits and development orders.

According to Florida's Statewide Emergency Shelter Plan, Hillsborough County had a shelter deficit of 55,152 people in 2004. This shelter deficit includes the vulnerable population in Tampa. 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.

Additional storm surge mitigation measures include: improvements to evacuation routes inside the CHHA (Policy 8.9 CME), using beach and dune stabilization techniques as coordinated with FDEP (Policy 3.2 CME), and limitations of public expenditures for infrastructure in CHHA (Objective 10 CME and policies following).

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 several policies directed at minimizing flooding and stormwater runoff, and protecting flood prone areas from potential development impacts. The Plan incorporates development controls in place to minimize the impact of new development within the 100-year floodplain which include: restricting encroachment into the 100-year floodplain of significant wetland and riverine systems (Policy 3.3 Conservation and Aquifer Recharge Element (CARE), intergovernmental coordination with the County and the Southwest Florida Water Management District in the development and implementation of a comprehensive Floodplain Management Ordinance (Policy 3.8 CARE), and the adoption of protective land development regulations for the Hillsborough River 100-year floodplain (Policy 23.1 CARE).

The mitigation of flood waters through stormwater quantity levels are addressed in the Stormwater Management Element. One of the main objectives of this element is to provide a stormwater system for virtually the entire city that does not allow flooding to extend into structures (Objective 1.1 SME). Level of service standards are adopted in policies 1.1.1, 2.1.2 and 6.1.3 of

the SME. Additionally, the City seeks to implement of a program that periodically inspects systems to ensure the development complies with permit requirements (Policy 6.1.2).

Wildfire

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

Sinkholes

Although the LMS considers sinkholes a moderate risk to Hillsborough County, the City of Tampa has identified sinkholes in the Comprehensive Plan in Policy 6.4 of the Conservation and Aquifer Recharge Element (CARE). Here, the City may require sub-surface investigations of soil suitability during the land development review process. Policy 23.1 of the CARE preserves sinkholes and springs through permitting processes and public education programs. Policy 3.1.2 of the Stormwater Management Element prohibits any new stormwater discharge into a sinkhole.

Summary of Preliminary Recommendations

The City of Tampa'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 Tampa can continue to reduce or eliminate risks to 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 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, 503 acres are susceptible to Category 1 storm surge (CHZ), 1,061 acres are susceptible to Category 1 – 3 storm surge (HVZ), 1,415 are susceptible to 100-year flood, 307 acres are susceptible to wildfire, and 551 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.

Storm Surge

About 87% of the 503 vacant acres in the Coastal Hazard Zone and 90% of the 1,061 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 to water related uses; 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 10-hour evacuation clearance time.
- The City should, in the CHHA, continue requiring that all new utilities be place underground; prohibiting septic tanks unless for exceptional circumstances; limiting publicly funded infrastructure to retrofitting storm water management systems, flood-proofing portable water and sanitary sewage facilities, and improving evacuation transportation routes; and not accepting responsibility for maintaining new roadways

or taking over maintenance of existing roadways, unless designated on the Long Range Transportation Map.

- The City should continue coordinating with the Florida Department of Transportation, the MPO, and Hillsborough County to ensure priority of maintaining capacity of evacuation transportation routes.
- 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.
- The City should consider retrofitting essential public facilities that exist in the CHHA to mitigate impacts from surge.
- The City should consider coordinating with Hillsborough 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 71% of the 1,415 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, in the 100-year floodplain, should continue implementing policies for restricting net encroachment of significant wetland resources, protecting natural flood assimilating capacity, minimizing the use of fill to meet minimum flood elevations and maintaining natural water tables, and clustering development to increase open space to protect floodplains.
- The City should continue the regular stormwater facility maintenance program, ensuring that post-development run-off does not exceed pre-developed discharge volumes/rates to ensure the level of service (LOS) standard is met, and other existing measures to minimize flood risk.
- The City should consider coordinating with Hillsborough 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 City 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 impose 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 prohibiting land filling which results in net loss of storage within in the 100-year floodplain.
- 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 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

About 87% of the 307 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 City 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 City 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 City 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 Local Fire Rescue Department.
- The City should consider increasing public awareness of prescribed burning and require management plans for conservation easements that address reduction in wildfire fuels.

Sinkhole

About 98% of the 551 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 City should continue implementing policies preserving unique environmental features, such as sinkholes, through permitting processes and public education programs; possibly requiring sub-surface investigations of soil stability in areas suspected of sinkhole activity; clustering development to increase open space for preserving natural resources, such as aquifer recharge areas; and ensuring that no new discharge enters existing sinkholes.
- The City should consider 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 prohibiting new stormwater management facilities from discharging untreated stormwater runoff into the Floridan Aquifer.
- The County should consider the possibility of requiring buffers between proposed development and sinkholes, as deemed appropriate.

General

- 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, floods, wildfires, and sinkholes, and make them aware of proactive steps they can take to mitigate damage.

6. 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

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

Goal: Minimize the effects of any potential natural or man-made disasters on our community and its infrastructure.

- Objective 1. Public Education. Increase public awareness in the use of mitigation programs and techniques to reduce the impacts of natural and man-made hazards.
- Objective 2. Coordination. Coordinate public and private sector participation in identifying and managing and/or implementing mitigation projects and measures throughout Hillsborough County.
- Objective 3. Development Management. Identify and implement a combination of regulatory, incentive and initiative programs that will reduce potential loss and would encourage participation in ongoing hazard mitigation.
- Objective 4. Critical Facilities. Develop and maintain an inventory management system on all data affecting hazard mitigation.

ATTACHMENT G
Hillsborough County Comprehensive Plan Excerpts Pertaining to Hazard Mitigation

CAPITAL IMPROVEMENTS ELEMENT

1.C.1.b.(3.b): The target-level for the ultimate level of service standard, relative to all major stormwater conveyance systems, is the 25 year/24 hour/B level, as well as compliance with the requirements of both the County's NPDES permit and the Comprehensive Conservation and Management Plan of the Tampa Bay National Estuary Program. This level corresponds to that which will be required to be provided by all new/future development, except that a greater freeboard, (to achieve flood-level "A" or better), is additionally required of new/future development. However, occasionally physical and/or environmental constraints will not allow an existing system to be modified to the target-level. In such a case the identified ultimate level of service standard is/will be the highest achievable level of service, as determined by a Stormwater Management Master Plan study, below the target-level.

1.C.1.b.(3.c): The identified ultimate level of service standard for a major County stormwater conveyance system which discharges into a City of Tampa stormwater conveyance system is the 5 year/24 hour/B level. This standard is based on the City's adoption of a 5 year/ critical duration/B level of service standard for its systems, and the general location of the City between portions of the County and Tampa Bay. However, in those areas where the City intends to improve its system to a higher level of service, the County will adopt a corresponding higher level of service standard, up to the 25-year/24 hour/B level.

1.C.1.b.(3.d): The identified ultimate level of service standards, for the major stormwater conveyance systems located within the areas for which completed Stormwater Management Master Plans currently exist (including older SMMPs which will be updated in the future), have been identified in the Stormwater Management Master Plan studies themselves. These systems will be upgraded to their ultimate level of service standards no later than FY2015. The areas for which Stormwater Management Master Plans currently exist, and the corresponding adopted (existing) and identified ultimate levels of service are:

Subbasin/Watershed	Adopted LOS	Ultimate LOS
Archie Creek	2 year/24 hour/B	10 year/24 hr/B
Buckhorn Creek	2 year/24 hour/B	10year/24hour/B
Curiosity Creek	3 year/72 hour/B	10year/72hour/B
Delaney Creek	3 year/24 hour/B	25year/24hour/B
Delaney Creek Popoff Canal	2 year/24 hour/B	25year/24hour/B
Duck Pond	1 year/24 hour/B	5 year/24 hour/B
East Lake Area	2 year/24 hour/B	25year/24hour/B
Lower Sweetwater Creek*	1 year/24/hour/B	10year/24hour/B
Nine Eagles Branch	25 year/24 hour/B	25year/24hour/B
North Archie Creek	1 year/24 hour/B	25year/24hour/B
Pemberton Creek/Baker Canal	2 year/24 hour/B	25year/24Hour/B
Raintree Area	3 year/24 hour/B	25year/24hour/B
Rocky Creek	2 year/24 hour/B	10year/24hour/B
Sweetwater Creek	2 year/24 hour/B	10year/24hour/B

*Note: The Henry Street Canal Watershed is contained within this sub-basin, and the identified levels of service are reflective of the "worst case" within the entire sub-basin.

1.C.1.b.(3.f): The adopted level of service standards for other types of stormwater management facilities are as follows:

- Storm sewer/swale collection system (minor stormwater conveyance system) designed/constructed prior to 1981: standard = 3 year/critical duration/A level for those systems in need of improvement due to documented poor physical performances, after

FY89, which result in flooding at levels C or D during a storm less than or equal to the target level event.

- Storm sewer/swale collection system (minor stormwater conveyance system) designed/constructed during or after 1981: standard = 3 year/critical duration/A level. prior to 1981 and all stormwater retention systems: standard = existing level of service for both retention and detention systems; ultimate target-levels = 25 year/24 hour/A (detention systems) and 100 year/24 hour/A (retention systems) for those systems in need of improvement due to documented poor physical performances, after FY89, which result in flooding at levels C or D during storms less then or equal to the respective target-level events.
- Stormwater detention pond/lake/storage area designed/ constructed during or after 1981: standard = 25 year/24 hour/A level.

As for major stormwater conveyance systems, occasionally physical and/or environmental constraints will prevent the upgrading, when necessary, of a facility to its appropriate target-level. In such cases, the facility will be upgraded to the highest achievable level of service below the corresponding target-level.

1.D.2.a: Calculated needs for capital improvements in high hazard coastal areas are subject to all limits and conditions in the "Coastal Management Element" of this Comprehensive Plan.

OBJECTIVE 5: The County shall protect the coastline and avoid loss of life and property in coastal areas by minimizing land development and public facilities in coastal high hazard areas. 9J-5.01 6(3)(b)2.

Policy 5.A: Publicly funded infrastructure shall not be constructed within the coastal high hazard area unless the expenditure is for:

5.A.1: Restoration or enhancement of natural resources or public access;

5.A.2: Land application of treated effluent disposal (irrigation) on public and private open spaces;

5.A.3: Flood-proofing water and sanitary sewerage facilities;

5.A.4: The development or improvement of public roads and bridges which are on the Hillsborough County Metropolitan Planning Organization long-range plan or the facility will serve a crucial need by ameliorating the evacuation time of residents of the County;

5.A.5: Reconstruction of seawalls that are essential to the protection of only existing public facilities or infrastructure;

5.A.6: A public facility of overriding public concern as determined by the

Hillsborough County Board of County Commissioners;

5.A.7: The retrofitting of stormwater management facilities for water quality enhancement of stormwater runoff; or

5.A.8: Port facilities.

COASTAL MANAGEMENT ELEMENT

OBJECTIVE 6: Residential population centers within the coastal high hazard area shall be limited to those areas which are planned to accommodate such development through the provision of adequate public facilities and services. Such development must meet storm velocity standards and be provided with adequate hurricane evacuation capability

Policy 6.1: The Coastal High Hazard Area shall be the area established in the most current regional hurricane evacuation study as requiring evacuation during a category one hurricane.

Where this definition and any graphic representation of this area are not consistent, the definition shall govern.

Policy 6.2: New development within the coastal high hazard area shall continue to be subject to the applicable site plan review process. As a component of the review process, the property owner shall provide adequate data to assess the impacts of the proposed development upon existing infrastructure within the coastal high hazard area, as well as level of service standards established for shelter capacity and clearance times.

Policy 6.4: The County shall delineate the coastal high hazard area on zoning maps.

Policy 6.5: The County shall require, to through the subdivision regulations, that all new construction of utility lines in the coastal high hazard area be placed underground. This requirement shall be subject to all other restrictions in this section.

Policy 6.6: The use of septic tanks for new development shall be prohibited in the coastal high hazard area. Regulatory review procedures and criteria for determining exceptions to this policy in cases of undue hardship shall continue to be applied to determine hardship exceptions.

Policy 6.7: Limit new development in the coastal high hazard area to uses that are vested, water enhanced, water related, water dependent, or further the port consistent with the Port Authority Master Plan and limit public expenditure.

OBJECTIVE 10: Limit public expenditures for infrastructure and facilities in the coastal high hazard area.

Policy 10.1: The County shall limit public infrastructure expenditures in the coastal high hazard area to:

a. Restoration or enhancement of natural resources or public access;

b. Flood-proofing existing potable water and sanitary sewerage facilities;

c. The development or improvement of public roads and bridges that are on the Metropolitan Planning Organization's Long-Range Transportation Plan or that serve a crucial need by ameliorating the evacuation time of residents of the county;

d. Reconstruction of seawalls that are essential to the protection of existing public facilities or infrastructure;

e. A public facility of overriding public interest as determined by the Hillsborough County Board of County Commissioners;

f. The retrofitting of stormwater management facilities for water quality enhancement of stormwater runoff; or

g. Port and port-related facilities.

Policy 10.2: Wastewater treatment facilities shall not be constructed within the coastal high hazard area unless the expenditure meets the criteria of Policy 10.1.

Policy 10.4: All new buildings, structures, uses and substantial expansions of existing uses, for commercial or industrial development on more than five acres of land or residential subdivisions exceeding ten lots, within the Coastal High Hazard Area (CHHA), other than government owned or leased facilities, shall be approved through a planned unit development process.

Policy 10.5: The use of septic tanks for new development shall be prohibited in the Coastal High Hazard Area, except in cases of excessive hardship where (1) no reasonable alternative exists, (2) a discharge from a septic tank will not adversely affect public health and will not degrade surface or ground water and (3) where the Health Department determines that soil conditions, water table elevation and setback provisions are adequate to meet state requirements.

OBJECTIVE 11: The County shall maintain adequate clearance times as identified in the most up-to-date Hurricane Study. Any proposed development shall not increase these clearance times.

Policy 11.1: In order to prevent unnecessary evacuees from crowding roads and shelters, during the hurricane season, the County shall continue to notify households of their need to evacuate at various threat levels. Hotels, motels and other similar facilities shall conspicuously post the need for evacuation, evacuation routes and shelter locations.

Policy 11.2: The County shall continue to identify new shelter space to meet the demands of the projected population. The standard shall be 20 square feet per person.

Policy 11.3: The County shall maintain capacity on all identified major evacuation routes maintained by the County so that the clearance times as identified by Tampa Bay Regional Planning Council in the most up-to-date Hurricane Study can be maintained.

Policy 11.4: The development review process shall include the review of the development's effect on evacuation clearance times and the number of persons requiring public shelter. Developments shall be reviewed and impacts assessed based on the most recently available data. This requirement shall apply to those developments located in the vulnerability zone and those located along and impacting evacuation routes.

Policy 11.5: The County shall continue to conduct an annual review of new development in the Coastal High Hazard Area, and coordinate with the City of Tampa to assure compliance with the Hurricane Evacuation Plan.

Policy 11.6: The County shall continue to coordinate all emergency management activities, including evacuation orders, with all state, regional, and local response agencies, and with adjacent local governments, to effect a safe and efficient evacuation and return of County residents.

Policy 11.7: Each new mobile home park shall include or designate a building or buildings for use as shelters for tenants during a hurricane. County development regulations shall be amended to include standards for shelter buildings.

Policy 11.8: The County, in cooperation with the Tampa Bay Regional Planning Council, shall annually review shelters in an effort to provide shelter space for the
worst case hurricane scenario.

Policy 11.9: The County, in cooperation with the Tampa Bay Regional Planning Council, shall continue to develop strategies to address the shelter space deficiency including utilizing churches in coordination with the Red Cross.

OBJECTIVE 12: The County shall continue to implement a post-disaster redevelopment ordinance to reduce or eliminate the exposure of human life and public and private property to natural hazards.

Policy 12.2: The County shall continue to implement, review, and amend as needed its Post-Disaster Redevelopment Ordinance, addressing long-term development, repair, and redevelopment activities, and including measures to restrict and eliminate inappropriate and unsafe development in the coastal high hazard area through Plan designated uses, zoning, and density and intensity limitations.

Policy 12.3: The County shall maintain an inventory and assessment of the value of all public facilities within the coastal high hazard area.

Policy 12.4: Any structure or infrastructure within the coastal planning area that is damaged in excess of 50 percent of its most recent assessed value, shall be rebuilt in conformance with all

current standards and requirements, including those enacted since the construction of the structure or infrastructure.

Policy 12.5: If any public structure or infrastructure within the coastal area is damaged in excess of 50 percent of its most recent assessed value, and if the County's post disaster redevelopment ordinance permits development, then the structure or infrastructure must be rebuilt to meet or exceed all current standards and requirements, including those enacted since the construction of the structure or infrastructure.

OBJECTIVE 13: The level of service standards, phasing of infrastructure, and areas of service within the coastal area shall be as established in the public facilities elements, Transportation Element, Recreation and Open Space Element, and Capital Improvements Element of the Comprehensive Plan; and the County shall limit its public infrastructure expenditures in the coastal high hazard area.

Policy 13.1: Interim wastewater treatment plants shall not be permitted in the coastal high hazard area except when County service will be available within five (5) years.

Policy 13.4: The County shall not accept responsibility for maintaining new roadways nor take over maintenance for existing private roadways, in the coastal high hazard area unless said roadway is designated on the future Traffic Circulation Map.

Policy 13.5: The County shall complete and maintain an inventory of existing infrastructure within the coastal high hazard area and develop a program to relocate or retrofit such facilities where feasible and as replacement becomes necessary.

Policy 13.6: The County shall ensure that future development and redevelopment within the coastal high hazard area is consistent with coastal resource protection and will not increase clearance times along evacuation routes.

Policy 13.7: Evacuation routes that are located in the coastal high hazard area and are subject to flooding shall be improved to the extent feasible to expedite the safe passage of evacuees in the event of mandatory evacuation.

Policy 13.8: No new solid waste or hazardous waste management sites shall be approved for location in the coastal high hazard area.

CONSERVATION AND AQUIFER RECHARGE ELEMENT

Policy 2.7: The County shall review, amend and implement regulations which protect and conserve surface water, ground water, aquifer recharge areas and wellfields to ensure a coordinated land and water policy approach including considerations of land use types and densities, impervious surface limitations, stormwater management plans and alternative site planning and engineering techniques.

Policy 2.8: The County shall protect the public against the threat of sinkholes through its planning and land development process, including publishing available sinkhole data and providing for consideration of sinkhole risk in the land suitability analysis of the Comprehensive Plan.

Policy 2.9: The County shall include the sinkhole phenomenon in its consideration of the suitability of land for development through the review process of land development codes, including appropriate stormwater management measures.

Policy 2.10: The County shall cooperate in an intergovernmental approach with the Southwest Florida Water Management District to provide technical expertise to the public with regard to sinkhole risks.

Policy 3.8: The County shall require that existing developments planned for expansion, modification or replacement provide or support stormwater treatment improvements within the affected drainage basin where treatment facilities are lacking. Where economically and environmentally feasible, the County shall require retrofitting of stormwater treatment facilities in urbanized areas lacking such facilities.

OBJECTIVE 5: The County shall continue to prevent net loss of 100-year floodplain storage volume in Hillsborough County. The County shall continue to protect and conserve natural wildlife habitat attributes where they exist within the 100-year floodplains of major rivers and streams.

Policy 5.1: The County shall protect the functions and values of all riverine wildlife corridors along rivers in the county as well as along creeks, such as those that may be associated with Rocky Creek, Bullfrog Creek, Cypress Creek, Blackwater Creek, Trout Creek, Double Branch Creek, and other creeks of similar size. Protected functions and values shall include floodwater conveyance, water storage, water quality enhancement, wildlife habitat, wildlife corridors, groundwater recharge, and minimum stream-flows. The degree of protection may vary depending on the location. Protection methods may include, but are not limited to, density and intensity restrictions of "non-water dependent" land uses**.**

Policy 5.2: The County, through the land planning and development review processes, shall continue to prohibit unmitigated encroachment into the 100-year floodplain of riverine systems.

OBJECTIVE 6: The ecological integrity of natural lakes and ponds shall be maintained or improved through the development and implementation of individual subbasin/watershed Stormwater Management Master Plans.

Policy 6.6: (in part) The County shall prepare and implement individual subbasin/watershed Stormwater Management Master Plans, which shall include:

Policy 6.9: Hillsborough County, in cooperation with the Southwest Florida Water Management District, shall review the adequacy of current stormwater design standards, including vegetated buffer requirements, in relation to lake water quality and implement changes as necessary.

Policy 7.4: A program to maximize recharge through the use of private and public stormwater management facilities shall be developed and implemented. This program may require, among other things, that pre-development groundwater recharge volumes and rates be maintained on site after development, if the site is located in an area of known or identified average annual recharge potential of at least two surface inches of water, and may include restrictions on the lowering of groundwater levels to meet stormwater management regulations. The County shall encourage stormwater retention rather than stormwater detention for new development projects in these areas through Best Management Practices (BMPs) in the land development and review process.

Policy 8.9: The County shall, through the development review process, restrict the substantial lowering of the water table to meet stormwater treatment or storage requirements.

Policy 12.3: During the land development review process, the County shall continue to evaluate and utilize, where appropriate, soil capability analyses for flood hazard, stability, permeability, and other relevant soil characteristics when permitting new development.

Policy 44.7: The County will continue to coordinate with Hillsborough Community College's efforts at the Cockroach Bay Environmental Studies Center to study land management practices such as exotic plant control and fire management. The Environmental Lands Acquisition and Protection Program can utilize the results of such studies to more effectively manage lands purchased throughout the area of concern.

FUTURE LAND USE ELEMENT

Land Use Suitability

OBJECTIVE A-1: Development orders shall not be issued unless development is suitable for the physical conditions of the land, including, but not limited to, topographical and soil conditions, and development mitigates those adverse impacts that it creates upon the physical conditions of the land that may affect the health, safety and/or welfare of the people who live and work within those particular areas.

Policy A-1.2: Soil capability analyses for flood hazards, stability, permeability and other relevant soil characteristics shall be considered when planning for new development.

Policy A-1.4: Development within areas defined by the Hillsborough County as "volume or peak sensitive" shall require higher performance standards to mitigate stormwater runoff.

Policy A-1.5: All development within the 100 year floodplain shall be in strict conformance with all development regulations that have jurisdiction development regulations.

Policy A-2.5: Permit the use of pervious pavement for parking spaces which exceed the minimum code requirements, and encourage its use through incentives which can include a reduction in the amount of required parking when pervious surfaces are used; or a reduction in stormwater retention areas, or additional mechanisms which are not in conflict with the provisions of this Plan.

OBJECTIVE A-7: New development should demonstrate clustered development to achieve open space that requires development to occur in a manner that protects natural resources (including wetlands, wildlife habitat, aquifer recharge, floodplains, and other resources) and/or permit the continuation of agricultural activities in areas suited for such uses.

Policy C-31.5: Encourage the use of stilted structures rather than fill to meet flood elevation construction requirements within the River Corridor Overlay District.

INTERGOVERNMENTAL COORDINATION ELEMENT

Policy 4.4: (in part) Hillsborough County shall, through the metropolitan transportation planning process, require transportation systems management plans as part of the approval process for development reviews. Such plans shall require the County to:

4. Evaluate and determine the level of public expenditures that subsidize development permitted in coastal high-hazard areas or reduce hurricane evacuation times.

SANITARY SEWAGE ELEMENT

Policy 4.1: New County, Community, and franchise wastewater treatment plants shall be prohibited in the Coastal High Hazard Area.

Policy 4.2: Interim wastewater treatment plants may be permitted in the Coastal High Hazard Area subject to close 24-hour monitoring when County service will be available to the development through projects in the County's 6-year CIP.

STORMWATER MANAGEMENT ELEMENT

Goal A: Provide the residents of Hillsborough County with a managed system of stormwater infrastructure which will:

(1) minimize the occurrences of damage due to flooding,

(2) improve the quality of surface waters,

(3) reestablish and create wetland habitat,

(4) improve the recharge of the potable water supply and

(5) provide opportunities for reuse and recreational benefits.

Policy 1.1: All new development shall be designed such that post-development stormwater runoff from the site shall be substantially similar to or better than predevelopment runoff in terms of rate, hydroperiod, and drainage basin, and shall meet applicable state and water management district water quality standards.

Policy 1.2: All nonresidential and nonagricultural redevelopment and expansions of existing nonresidential and nonagricultural development shall construct or contribute to a stormwater management system for the entire site which:

a. treats stormwater runoff to state and water management district water quality standards, and

b. has a runoff rate which is substantially similar to that for predevelopment conditions.

OBJECTIVE 2: Evaluate the storage and discharge characteristics of existing stormwater conveyance, detention and retention systems to identify existing and future flooding problems and their solutions, and evaluate water quality degradation related to stormwater runoff to identify potential solutions to excessive pollutant loadings.

Policy 2.4: Following the completion of a Watershed Management Plan study, identified stormwater management facility improvement projects will continue to be incorporated into the next Stormwater Management Capital Improvement Plan/Capital Improvement Element update, as projects are developed and funds are identified for construction.

Policy 2.5: The established formal prioritization methodology, relating to the scheduling of stormwater management facility improvement projects will be used to annually reevaluate and update the Stormwater Management Capital Improvement Plan contained in the Capital Improvements Element.

Policy 2.9: The use of stormwater storage facilities will be the preferred alternative to alleviate flooding problems. All stormwater management projects will seek to maximize, to the greatest extent practicable, improvements to wetland habitat, water quality and groundwater recharge functions.

OBJECTIVE 3: Implement programs and projects to control flooding attributable to, and improve the quality of, stormwater runoff to maximize the benefits and beneficial uses of the stormwater resource.

Policy 3.2: Only those stormwater management facility improvement projects included in the Stormwater Management Capital Improvement Plan will be implemented, unless actual significant flooding conditions dictate the immediate need to implement other stormwater management improvement projects.

Policy 3.3: Development in the 100-year floodplain shall be regulated in order to protect floodplain functions. Total flood volume compensation will continue to be required for new developments which encroach into and displace 100- year riverine flood storage or floodplain areas. All development in the 100- year floodplain of rivers shall provide a minimum 50-feet buffer from the landward extent of wetlands.
The Watershed Management Plans underway by the Public Works Department will ensure compliance with regional plans.

Policy 3.5: The County will continue to establish and maintain an informal communication network with other government agencies which have authority over, or interest in, stormwater management practices in the County.

Policy 3.9: New stormwater management facilities will not be permitted to discharge untreated stormwater runoff into directly-connected sinkholes or, otherwise, directly into the Floridan Aquifer. Existing facilities will also be modified to meet this policy where economically feasible and physically practical.

OBJECTIVE 4: Stormwater management systems and facilities shall be operated and maintained in a manner which will support the continued provision of the adopted level of service standards.

Policy 4.3: An annually updated "repair and replacement" list will continue to be developed to prioritize those facilities which are physically in need of "more than routine" improvements. Such facilities will then be incorporated into the Stormwater Management Capital Improvement Plan: as corresponding Watershed Management Plans are completed, or via the Secondary System Improvement Fund.

Policy 5.2: Stormwater Levels of Service (LOS) for watersheds in the County will be identified in the Capital Improvement Element after completion of Watershed Management Plans, and capital projects identified and scheduled to achieve watershed levels of service.

ATTACHMENT H
City of Tampa Comprehensive Plan Excerpts Related to Hazard Mitigation

Conservation and Aquifer Recharge Element

Policy 3.3: The City, through the land planning and development review processes, shall restrict net encroachment into the 100-year floodplain of significant wetland and riverine systems in accordance with the provisions of the Environmental Resource Permit Rules, Chapters 40D-4, 40D-40, 40D-400, 62-343, 62-340 and 62-341 Florida Administrative Code, F.A.C. (administered by the Southwest Florida Water Management District and the Florida Department of Environmental Protection).

Policy 3.8: The City supports the protection of the wildlife habitat attributes of the floodplain of the Hillsborough River, where present. The City shall work with Hillsborough County and the Southwest Florida Water Management District to develop and implement a comprehensive Floodplain Management Ordinance, including measures and procedures to protect the natural flood assimilating capacity and wildlife habitat attributes of the 100-year floodplain of the Hillsborough River, particularly upstream of the dam.

Policy 6.4: During the land development review process, the City of Tampa may require sub-surface investigations of soil stability in areas suspected of sinkhole activity.

Policy 14.5: The City will seek means of minimizing filling as a means of meeting minimum flood elevations where appropriate to reduce the destruction of native plant communities and will strive to maintain natural drainage patterns and water table levels, where practical.

Policy 15.1: (in part) By 2000, the City shall adopt or amend protective land development regulations and performance standards for development or redevelopment proposed within, or adjacent, to the following Resource Protection Areas such as:

- Hillsborough River 100-year floodplain.

Policy 23.1: Wetlands and uplands with significant wildlife habitat or unique environmental features such as springs or sinkholes, shall be preserved through permitting processes and public education programs and balanced with other areas of overriding public interest.

Capital Improvements Element

OBJECTIVE 1.5: Public expenditures in high hazard coastal areas shall be consistent with the Recreation and Open Space Element, Stormwater Drainage Element, Transportation Element, Sanitary Sewer Element, Potable Water Element, Solid Waste Element, and the Future Land Use Element and shall not be inconsistent with the Coastal Management Element.

Policy 1.5.1: The City shall expend funds in high hazard coastal areas for the replacement and renewal of existing public facilities as long as that is consistent with Coastal Management, Conservation, and Land Use Element policies.

Policy 1.5.2: The City shall continue to provide or require provision of recreational facilities within high hazard coastal areas.

Coastal Management Element

Policy 3.2: The City shall coordinate with the Florida Department of Natural Resources to implement state-of-the-art beach and dune stabilization techniques where appropriate.

Policy 3.4: New construction of buildings on beaches shall be required to meet all FEMA development standards.

Policy 3.6: By 2000, the City shall develop an estuarine beach enhancement program which shall consider the public costs and benefits of improving, expanding and stabilizing public beach front access areas on Tampa Bay.

OBJECTIVE 4: Residential population centers within the coastal high hazard area shall be limited to those areas which are planned to accommodate such development through the provision of adequate public facilities and services. Such development must meet storm velocity standards and be provided with adequate hurricane evacuation capability.

Policy 4.1: The coastal high hazard area shall be defined as the FEMA Velocity Zone or the area identified in the most current regional hurricane evacuation study as requiring evacuation during a Category 1 hurricane event, whichever is greater.

Policy 4.2: The City shall monitor hurricane shelter capacity and work with Hillsborough County in maintaining a proper disaster preparedness program.

Policy 4.3: The City, in cooperation with other public and private entities, will ensure notification of the hurricane evacuation routes and shelter locations and capacities to residents and businesses in the coastal high hazard area.

Policy 4.4: Limit new development in the coastal high hazard area (CHHA) to uses that are vested, water enhanced, water related, water dependent, or which further development and redevelopment of the port consistent with the Tampa Port Authority Master Plan, and limit public expenditures for infrastructure within the coastal high hazard area.

Policy 4.5: The coastal high hazard area shall include the FEMA V zone and/or the area identified in the most recent regional hurricane evacuation study as requiring evacuation during a Category 1 hurricane event. Development in the coastal high hazard area shall be consistent with applicable provisions of the Building and Construction Regulations Code of the city of Tampa. Additionally, for those areas of the coastal high hazard area subject to the Tampa Port Authority Master Plan, development and redevelopment shall be consistent with the Tampa Port Authority Master Plan and other applicable regulations.

Policy 4.6: The City shall ensure that future development and redevelopment within the coastal high hazard area is consistent with coastal resource protection and will not measurably increase clearance times along evacuation routes to an unacceptable level and shall be in accordance with adopted evacuation plans and land development regulations.

Policy 4.7: Any structure within the coastal planning area that is damaged in excess of 50% of its most recent assessed value shall be rebuilt to meet or exceed all current requirements, including those enacted since the construction of the structure.

Policy 4.9: The City shall encourage, where feasible, by regulations, that all new construction of utilities in the coastal high hazard area be placed underground.

Policy 4.10: The use of septic tanks for new development shall be prohibited in the coastal high hazard area. Review procedures and criteria shall be established that will address exceptions to this prohibition. These review procedures will include all of the following, but not be limited to: no public service is currently available to the site and none is planned in the current year capital budget; discharge from the septic tank will not adversely affect public health and will not degrade surface or ground water; and the Health Department will determine that soil conditions, water table elevation and setback provisions are adequate to meet state requirements. Where septic tanks currently exist in the coastal high hazard area, the City shall request the County Health Department to conduct a survey to determine if the tanks are functioning properly. By 1994, the City in cooperation with the County Health Department shall develop a program to remedy any deficiencies noted in the inventory.

Policy 8.1: In order to prevent unnecessary evacuees from crowding roads and shelters, the City of Tampa shall, prior to the 1991 hurricane season, notify each household of its need to evacuate at various threat levels. Hotels, motels and other similar facilities shall conspicuously post in each room the need for evacuation, evacuation route and shelter location. Each new dwelling unit shall be provided with this information when the certificate of occupancy is issued. Beginning in 1991, the notifications shall be sent at 5-year intervals.

Policy 8.2: The City of Tampa shall continue to identify new shelter space to meet the demands of the projected population. The standard shall be 20 square feet per person.

Policy 8.3: The City of Tampa shall develop and implement a program to inspect vegetation and other objects along hurricane evacuation routes prior to each hurricane season and identify those likely to cause trouble in the event of a tropical storm. Threatening objects should be removed or secured in accordance with the provisions of the City's Landscaping and Tree Ordinances, at either public or private expense.

Policy 8.4: The City shall conduct an annual review of new development in the Coastal High Hazard Area, and coordinate with Hillsborough County's Emergency Management Division to assure compliance with the Hurricane Evacuation Plan.

Policy 8.5: The City of Tampa shall maintain adequate capacity on all identified major evacuation routes for which it is responsible so that the clearance time as identified in the most recent hurricane evacuation study can be maintained. However, the clearance time shall not exceed 10 hours.

Policy 8.6: The City of Tampa shall continue to assess the effect on evacuation clearance time and number of persons requiring public shelter to the review process for the issuance of building permits and development orders. Developments shall be reviewed and impacts assessed based on Hillsborough County's most current data.

Policy 8.7: The City of Tampa shall coordinate all emergency management activities including evacuation orders with all State, regional, and local response agencies including Hillsborough County, to affect a safe and efficient evacuation and resettlement of City residents.

Policy 8.8: An optimal amount of hurricane evacuation shelter space and an adequate clearance time for evacuation shall be maintained for the coastal high hazard area. Those standards are determined by the Tampa Bay Regional Planning Council and maintained by Hillsborough County. The City shall continue to assist Hillsborough County to maintain those standards by: 1) providing information regularly on development activity that increases residents or employees in the coastal high hazard area; 2) coordinating with Hillsborough County Emergency Management Division to provide an impact analysis on shelter space and clearance times for large scale developments during the development review process; and 3) offering assistance to Hillsborough County's Emergency Management Division to plan and provide for identified shelter space and clearance times.

Policy 8.9: Evacuation routes which are located in the coastal high hazard area and are subject to flooding shall be improved to the extent feasible to ensure the safe passage of evacuees in the event of mandatory evacuation.

OBJECTIVE 9: By 1997, the City shall adopt or develop a comprehensive post-disaster redevelopment plan to reduce or eliminate the exposure of human life and public and private property to natural hazards. That plan will include: 1. An intermediate response strategy; and 2. A long-term redevelopment strategy.

Policy 9.1: The City shall maintain, and update periodically, its inventory and value assessment of all City-owned public facilities, with a reasonable chance for damage, within the coastal high

hazard area. This inventory and assessment shall be used to develop a contingency action plan in the event of a natural disaster.

Policy 9.2: As part of the post disaster redevelopment plan, the City shall adopt a redevelopment decision-making matrix for deciding whether public infrastructure should be rebuilt, relocated, or structurally modified. The Public Infrastructure Decision-Making Matrix prepared by the Department of Community Affairs shall be considered as a guideline for this matrix.

OBJECTIVE 10: Minimize public infrastructure expenditures in the coastal high hazard area (CHHA).

Policy 10.1: Publicly funded infrastructure shall not be constructed within the coastal high hazard area unless:

a. The expenditure is for restoration or enhancement of natural resources or public access; or

b. The expenditure is for the retrofitting of storm water management facilities for water quality enhancement of storm water runoff or the construction of storm sewer outfalls; or

c. The expenditure is for flood-proofing potable water and sanitary sewerage facilities; or

d. The expenditure is for the development or improvement of public roads and bridges which are in the City of Tampa or Hillsborough County MPO Long Range Plan or the facility will serve a crucial need by ameliorating the evacuation time of residents of the City of Tampa; or

e. The expenditure is for a public facility of overriding public concern as determined by the City Council (e.g. the expansion of the Hooker's Point Sewer Treatment Plant); or

f. The expenditure is for reconstruction of seawalls that are essential to the protection of existing public facilities or infrastructure; or

g. The expenditure is for land application of treated effluent (irrigation) of public and private open spaces.

h. The expenditure is for infrastructure to serve development or redevelopment consistent with the Tampa Port Authority Master Plan.

Policy 10.2: The city of Tampa shall not accept responsibility for maintaining new roadways nor take over maintenance for existing roadways in the coastal high hazard area unless said roadway is designated on the Long Range Transportation Map.

Future Land Use Element

Policy C-2.5: (in part) The following environmentally sensitive areas shall be protected. Proposed development and redevelopment proposals that may directly impact any of these areas shall be assessed for negative environmental impacts to these areas, and mitigation will be required in accordance with local, state and federal environmental regulations.

- Hillsborough River 100 year floodplain;
- Tampa Bay tidal creeks and associated tidal wetlands;
- Areas of high aquifer recharge/contamination potential;

OBJECTIVE C-3a: Lands subject to Florida Administration Commission Final Order No. AC-93-087 that are annexed into the City of Tampa – Development must be clustered in order to increase the amount of open space acreage for preservation of natural resources (including significant wildlife habitat, aquifer recharge, floodplains and other resources).

Policy D-6.6: The City shall require that stormwater mitigation be incorporated into the landscaping plans as an amenity, where practical and feasible.

Policy D-1.2: Soil capability analyses for flood hazards, stability, permeability and other relevant soil characteristics shall be considered when planning for new development.

Policy D-1.3: All development within the 100 year floodplain shall be in strict conformance with applicable development regulations.

Stormwater Management Element

GOAL 1: Provide a stormwater system which is both quantity and quality sensitive and which protects the life and property of the citizens of the City.

OBJECTIVE 1.1: By 2015, provide a stormwater system for 98% of the City that allows flooding which does not extend into structures (during a design storm event of five year recurrence interval.)

Policy 1.1.1: Master Drainage Plans shall be formulated to provide a minimum of Level C service during a design storm based on a 5 year recurrence interval, the basin's critical duration and the Florida Dept. of Transportation Zone 6 rainfall curves.

Policy 1.1.3: Implement a Capital Improvement Plan to address existing stormwater system deficiencies.

Policy 1.1.4: Explore Basin Assessment Districts, basin fees, tax increment financing, and a stormwater utility to assure needed funding for stormwater management.

Policy 1.1.5: Priority for capital expenditures will be given to existing facility deficiencies first, replacement of facilities second and future facility needs third. (See Stormwater Needs Identification methodology in the Appendix.

Policy 1.1.6: The City recognizes the need to develop a comprehensive stormwater plan by July 1, 1998, that will consider the recommendations of the SWIM program and the National Estuary Program, solve the stormwater flooding and quality problems and support redevelopment within the City. The City will proceed to develop such a comprehensive plan which will include creative funding mechanisms, such as special districts, etc.

OBJECTIVE 1.2: Always coordinate the extension of or an increase in the size of major stormwater conveyance systems with other utility organizations utilizing the same right-of-way or easement, and with other drainage organizations that may be responsible for, or share in the utilization of the improved system.

Policy 1.2.3: Coordinate and obtain permits from Florida Department of Transportation/Hillsborough County for all new connections of City stormwater systems to the State/County system or whenever the connection of the City system with the State/County system is planned for enlargement.

Policy 2.1.2: Stormwater management for development and redevelopment in the City will be regulated by standards at least equal to SWFWMD Chapters 40D-4, 40D-40 and 40D-400 and the Department of Environmental Protection.

Policy 2.1.3: For projects on sites greater than 10,000 square feet, stormwater regulations will require treatment and attenuation for the entire site for new development and from the area of new construction for redevelopment.

Policy 3.1.2: Continue to ensure no new discharge into existing sinkholes.

GOAL 4: Ensure existing stormwater facilities are operating at optimal capacity.

OBJECTIVE 4.1: Continue the regular stormwater facility maintenance program.

Policy 4.1.5: Remove siltation and vegetation from ditches and storm sewers to ensure design capacity is maintained.

OBJECTIVE 4.2: By 2000 all existing stormwater facilities will be inspected to determine their need for replacement/rehabilitation.

Policy 4.2.1: Continue to inspect older storm sewers in order to correct deficiencies before they become serious problems. Strive for periodic inspections.

Policy 4.2.2: Place pumping stations on a rehabilitation schedule.

GOAL 6: Ensure that existing stormwater facilities are capable of meeting the projected demand by limiting the impact of new development.

Policy 6.1.1: Design of stormwater management facilities shall be based on the criteria established in the Stormwater Management Technical Standards Manual.

Policy 6.1.2: By 1998, implement a periodic inspection program to ensure development complies with permit requirements and private facilities are maintained to City standards.

Policy 6.1.3: Development will be regulated to ensure its post-development runoff to City systems does not exceed the pre-developed discharge volume and/or rate to ensure the level of service of the existing stormwater system is not compromised (LOS).

Transportation Element

OBJECTIVE 1.3: By 2015, provide for a transportation system that permits safe evacuation in the event of man-made or natural disasters, within the parameters established in Tampa Bay Regional Planning Council's evacuation plan.

Policy 1.3.1: Continue coordination and cooperation with the Tampa Bay Regional Planning Council's (TBRPC) efforts of hurricane evacuation.

Policy 1.3.2: The City of Tampa will continue to work with the Florida Department of Transportation, the MPO and the County to ensure a priority is placed on maintaining the capacity of highways that are designated as regional evacuation routes.