

# **Integrating Hazard Mitigation into Comprehensive Planning**

## **Miami-Dade County Profile**

**Florida Department of Community Affairs**

## Executive Summary

The experiences of the 2004 and 2005 hurricane seasons epitomize the importance of better integrating hazard mitigation activities into local comprehensive planning. In the fall of 2004, residents all over the state experienced significant damages from Charley, Frances, Jeanne, and Ivan as a result of winds, tornadoes, surge, and/or flooding. But these were not the only times we have experienced natural disasters, nor will they be the last. In 1992, Hurricane Andrew devastated South Florida. In 1998 and 1999, most counties in Florida experienced wildfires. In some cases, despite firefighters' best efforts, 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 Miami-Dade County Profile has been prepared as part of a statewide effort by the Florida Department of Community Affairs to guide local governments in integrating hazard mitigation principles into local Comprehensive Plans. Information provided in this profile will enable planners to (1) convey Miami-Dade 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 be better integrated into the Comprehensive Plan; and (4) determine if any enhancements could be made to the Local Mitigation Strategy (LMS) to better support comprehensive planning. Best available statewide level data are provided to convey exposure and risk as well as illustrate the vulnerability assessment component of the integration process.

In this profile, we present an argument for why hazard mitigation needs to be a part of comprehensive planning through an examination of population growth, the hazards that put the County at risk, the special needs population and structures that could be affected by these hazards, and the distribution of existing and future land uses in different hazard areas. We hope that this analysis will serve as an example of the issues each jurisdiction should consider as they update their plans to include hazard mitigation. The profile also contains a review of the LMS and the Comprehensive Plan. Based on the analysis and review, we were able to develop specific options for the County on how to incorporate more hazard mitigation into the Comprehensive Plan and how to enhance the LMS so that it is also a better tool for local planners.

During our review, we found that Miami-Dade County had many strengths regarding hazard mitigation in both its LMS and Comprehensive Development Master Plan (CDMP), and these are outlined in the profile. There are always ways to further strengthen such plans, however, and the following is a summary of some of the options that would enable the County to do so.

### MIAMI-DADE COUNTY GENERAL RECOMMENDATIONS

- Existing CDMP policies that promote the conservation and acquisition of natural resources can be amended to include hazard mitigation as an added benefit. Currently, there are many policies that promote the management and protection of natural resources, wetlands, coastal resources, soils, and environmentally sensitive areas, but hazard mitigation is not included as a benefit to these efforts. Natural resources such as coastal vegetation and barrier islands absorb the impact of storm surge that otherwise could damage coastal development. The natural drainage features of wetlands and water bodies provide stormwater drainage. Adding hazard mitigation as a benefit to



CDMP policies can illustrate the importance of environmental protection as a means of protecting lives and property.

- Coastal Management Element Policy 8K can be updated to accommodate future projections of hurricane evacuees from Dade and Monroe County. The LMS could be amended to include a goal that aims to provide adequate emergency shelter space based on the State Shelter Plan or other more rigorous internal studies. Creating a goal in the LMS that focuses on emergency shelters can improve the overall hazard mitigation strategy by keeping shelter needs in the forefront of hazard mitigation in Dade County. There are currently many strong shelter policies in the Comprehensive Plan that utilize a range of techniques including private and public partnerships, promotion of safe rooms, and coordination between jurisdictions to provide shelters. These policies can be amended to emphasize future shelter capacity, since shelter demand will undoubtedly increase as development occurs in Dade County.
- The LMS could include a detailed analysis of potential monetary losses to specific structures by hazard type. This could be used as a tool to further analyze the risks associated with each disaster type. The analysis of potential monetary losses could be used to analyze existing policy and create new policies aimed at avoiding the damages caused by natural disasters.
- The County can include LMS goals and objectives that aim to continue existing conservation and natural resource protection efforts. These goals and objectives could also support the continual enhancement of environmental programs, collection of data, and cooperation with federal, state, regional, and local jurisdictions. Currently, there are no goals or objectives in the LMS that promote environmental protection. Adding a goal or objective to the LMS can help strengthen the conservation, land acquisition, and resource management practices that protect the environment as well as the additional benefits natural resources provide for hazard mitigation, including absorption of wave impact, erosion control, wildfire management, and natural drainage features. Including this policy framework in the LMS could also better incorporate the strategy provided by existing CDMP policies that protect the environment.
- The County could further explore an active relationship with the Department of Forestry to address wildfire mitigation. Educational information, controlled burn services, and land management recommendations from the Department of Forestry could be used to address wildfire prone areas before development occurs. Such efforts could be included in the Comprehensive Plan and land development regulations. The analysis in **Section 2** and the maps in **Attachment C** of this report suggest future development may encroach on wildfire hazard areas adjacent to Route 997. Addressing wildfire threats near residential areas can help prevent loss of property and life.
- The County can include a goal or objective in the LMS that aims to relocate existing public facilities away from natural hazard areas, as suggested by CDMP Policy 10E of the Coastal Management Element. Including a goal or an objective in the LMS could act as a vehicle to reach the CDMP strategy of protecting public facilities.
- The County can add a policy to the CDMP that aims to prevent future repetitive loss properties and mitigate existing repetitive loss properties. The analysis in **Section 2** of this report shows there are 1,801 structures in Miami-Dade County that have had repetitive damage but have not been mitigated. Goal 3 of the Local Mitigation Strategy aims to reduce and eliminate repetitive loss properties. Including a policy in the CDMP can strengthen this strategy and promote countywide initiatives to reduce structure damage.

- The County can add a goal to the LMS that seeks to limit populations and development in high hazard areas including the Coastal High Hazard Area. The County currently has many goals in the CDMP that aim to do this but nothing is included in the LMS. Including such a goal in the LMS could help reduce the number of people and structures at risk from natural disasters across jurisdictional lines. Also, including this goal could help create a more unified overall hazard mitigation strategy for the region.
- The County could include a goal or objective that aims to limit public expenditures in high-hazard areas. Currently, there are policies in the CDMP that restrict or prohibit public expenditures in the CHHA. Including a goal in the LMS could strengthen the strategy of steering development away from hazard areas as well as limiting the amount of County investment at risk from natural disasters.
- The County could adopt a policy in the Capital Improvements Element that establishes a level-of-service standard for evacuation clearance times. Also, the County could adopt or amend policies so they aim to improve evacuation times. **Table 2.2** shows that it would take 17.5 hours to safely evacuate at-risk populations in a Category 2 or greater hurricane. Currently, there are policies that address many aspects of evacuation, but no policy aims at improving evacuation times. Improving evacuation times could help ensure the safety of many County residents, including the 132,891 disabled people that are at risk from hurricane surge, as shown in **Table 2.1** of this report. Also, having a level-of-service standard in the CDMP can help ensure infrastructure is present before development occurs.

As part of this study, a similar analysis to that of the County profile was completed for a statewide sample of 14 Florida municipalities, including Miami Beach in Miami-Dade County. Some options for integration of hazard mitigation into the City's comprehensive plan are as follows:

#### MIAMI BEACH GENERAL RECOMMENDATIONS

- The City can adopt a Comprehensive Plan policy that promotes input from County emergency managers and officials when making Comprehensive Plan amendments and land use changes in order to analyze any effects on hazard mitigation initiatives including evacuation route capacity, public facilities, public personnel, and infrastructure. There were no policies found during this review that support the involvement of emergency managers when making such decisions. Involving emergency managers in matters that address land development is a strong hazard mitigation strategy because it may allow insight into hazard mitigation issues and lead to mitigation prior to development.
- The City can add a Comprehensive Plan policy that supports the City's involvement and adherence with the Miami Dade Local Mitigation Strategy (LMS). There were no policies found during this review that support involvement with the countywide LMS. The LMS includes an updated list and a narrative description of the hazard mitigation initiatives for the City of Miami Beach in *Part II: The Projects* (Miami-Dade County, 2005, page 126). Adding a Comprehensive Plan policy that supports the LMS can further bridge the City's hazard mitigation strategy to the regional strategy. Also, the City could explore the strengths of the LMS in order to enhance its overall hazard mitigation strategy. The City could use the LMS goals and objectives to explore additional Comprehensive Plan policies aimed at protecting the health, safety, and welfare of the community.
- The City could revise the criteria found in Capital Improvements Element Policy 1.5 to include projects that reduce the threats associated with natural disasters. There were no policies found in the CIE during this review that directly address hazard mitigation initiatives. A policy could link the hazard mitigation initiatives found in the County LMS to

the 5-year Schedule of Capital Improvements to secure a timeframe and funding sources to achieve project completion.

- The City can create policies that adopt level of service (LOS) standards for evacuation route capacity demand, evacuation route clearance times, and emergency shelter capacity. The analysis in this report shows that evacuation clearance times and shelter capacity are a countywide challenge. LOS standards could be based on the regional evacuation plans and the State Shelter Plan. These LOS standards could act as a benchmark to measure adequate services for city residents. The effects of proposed future development could be analyzed to measure the affects on the level of service standards. The City could also explore a policy framework to maintain or improve the LOS standards, possibly through impact fees or other concessions. Further, Capital Improvements Element Policy 1.5 criteria three, already prioritizes projects that prevent city services from falling below adopted LOS standards. Creating LOS standards for evacuation route capacity or evacuation route clearance times, and shelter capacity may help prioritize projects aimed at meeting deficiencies.
- The City can integrate the educational strategy found in Miami-Dade LMS Goal 5, found in **Attachment E** of this document, into the Comprehensive Plan. Currently, the Comprehensive Plan contains one policy that promotes public education and dissemination of hazard related information dealing with emergency operation instructions and hurricane evacuation pick-up sites. This policy could be amended to include flood mitigation techniques, programs aimed to assist repetitive loss structures, and the importance of protecting the natural environment. The City could further its commitment to providing hazard mitigation information to the public by amending this policy. Also, the City could adopt a policy that promotes the training and education of city officials including site plan reviewers, land use planners, engineers, building inspectors, planners, and emergency managers in hazard mitigation techniques. This is a proactive way to address existing and future development in regard to known hazards.
- The City can adopt a policy that aims to relocate or retrofit substandard structures and public facilities in high hazard areas. There were no policies that address mitigative actions for public and private structures, as well as repetitive loss structures, at risk from the effects of natural disasters. The hazard mitigation initiatives for the City listed in the LMS include a list of public structures in need of window protection. Adding a policy to the Comprehensive Plan could ensure these efforts are continued in the future. The City could also explore a policy that promotes acquisition or retrofit of repetitive loss structures in order to reduce property damages associated with natural disasters.

**Table of Contents**

Executive Summary ..... i

1. County Overview ..... 1

2. Hazard Vulnerability ..... 3

3. Existing Mitigation Measures ..... 10

4. Comprehensive Development Master Plan Review ..... 12

5. Recommendations ..... 13

6. Municipal Case Study: Miami Beach ..... 26

7. Sources ..... 38

Attachments.....

    Attachment A: Maps of the Existing and Future Land Uses within the Coastal Hazard Zone and the Hurricane Vulnerability Zone ..... A-1

    Attachment B: Maps of the Existing and Future Land Uses within the 100-year Floodplain ..... B-1

    Attachment C: Maps of the Existing and Future Land Uses within Wildfire Susceptible Areas ..... C-1

    Attachment D: Maps of the Existing and Future Land Uses within Potential Sinkhole Hazard Areas ..... D-1

    Attachment E: Miami-Dade County Local Mitigation Strategy Goals and Objectives ..... E-1

    Attachment F: Miami-Dade County Comprehensive Plan Excerpts Related to Hazard Mitigation ..... F-1

    Attachment G: Miami Beach Comprehensive Plan Excerpts Related to Hazard Mitigation..... G-1

# 1. County Overview

## Geography and Jurisdictions

Miami-Dade County is located on the Southeastern tip of Florida. It covers a total of 1,946 square miles with an average population density of 1157.9 people per square mile (U.S. Census, 2000).

There are 34 incorporated municipalities within the County, and these are listed in **Table 1.1**.



## Population and Demographics

Official 2004 population estimates for all jurisdictions within Miami-Dade County as well as the percent change in population from the 2000 U.S. Census are presented in **Table 1.1**. The most current estimated countywide population of Miami-Dade County is 2,379,818 people (University of Florida, Bureau of Economic and Business Research, 2004). The most populated city in Miami-Dade County is Miami, with an estimated 379,550 residents. Despite the many incorporated areas, an estimated 46.2% of the countywide population lives in the unincorporated portion of the County. Between 1990 and 2000, Miami-Dade County as a whole had a growth rate of 16.3%, which was less than the statewide growth rate of 23.5% in those 10 years.

**Table 1.1 Population Estimates by Jurisdiction**

Jurisdiction	Population, Census 2000	Population Estimate, 2004	% Change, 2000-2004	% of Total Population (2004)
Unincorporated	1,204,705	1,098,940	-8.8%	46.2%
Aventura	25,267	28,207	11.6%	1.2%
Bal Harbour	3,305	3,409	3.1%	0.1%
Bay Harbor Islands	5,146	5,201	1.1%	0.2%
Biscayne Park	3,269	3,555	8.7%	0.1%
Coral Gables	42,249	44,345	5.0%	1.9%
Doral	0	30,285	N/A	1.3%
El Portal	2,505	2,550	1.8%	0.1%
Florida City	7,843	8,715	11.1%	0.4%
Golden Beach	919	997	8.5%	0.0%
Hialeah	226,419	233,566	3.2%	9.8%
Hialeah Gardens	19,297	20,441	5.9%	0.9%
Homestead	31,909	36,501	14.4%	1.5%
Indian Creek Village	33	33	0.0%	0.0%
Islandia	6	6	0.0%	0.0%
Key Biscayne	10,507	11,160	6.2%	0.5%
Medley	1,098	1,123	2.3%	0.0%
Miami	362,470	379,550	4.7%	15.9%
Miami Beach	87,933	91,540	4.1%	3.8%
Miami Gardens	0	105,414	N/A	4.4%
Miami Lakes	0	24,835	N/A	1.0%
Miami Shores	10,380	10,462	0.8%	0.4%
Miami Springs	13,712	13,783	0.5%	0.6%
North Bay	6,733	6,614	-1.8%	0.3%

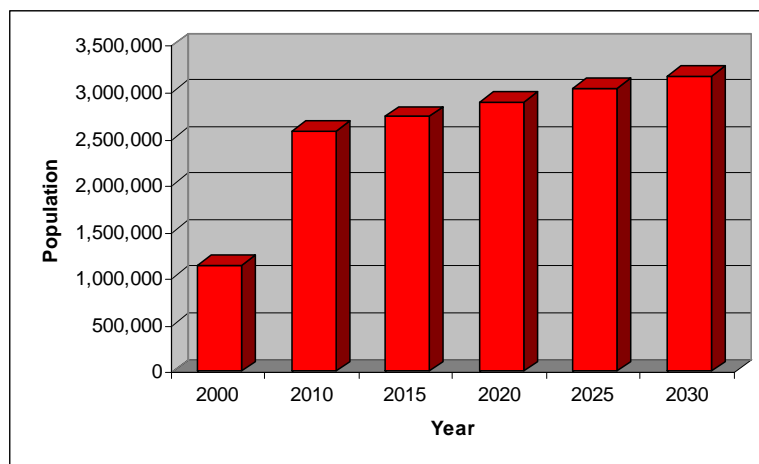
**Table 1.1 Population Estimates by Jurisdiction**

Jurisdiction	Population, Census 2000	Population Estimate, 2004	% Change, 2000-2004	% of Total Population (2004)
North Miami	59,880	60,101	0.4%	2.5%
North Miami Beach	40,786	42,359	3.9%	1.8%
Opa-locka	14,951	16,116	7.8%	0.7%
Palmetto Bay	0	24,903	N/A	1.0%
Pinecrest	19,055	19,317	1.4%	0.8%
South Miami	10,741	10,891	1.4%	0.5%
Sunny Isles Beach	15,315	16,580	8.3%	0.7%
Surfside	4,909	5,564	13.3%	0.2%
Sweetwater	14,226	14,267	0.3%	0.6%
Virginia Gardens	2,348	2,356	0.3%	0.1%
West Miami	5,863	6,132	4.6%	0.3%
<b>Countywide Total</b>	<b>2,253,779</b>	<b>2,379,818</b>	<b>5.6%</b>	<b>100.0%</b>

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

According to the University of Florida, Bureau of Economic and Business Research (2004), Miami-Dade County’s population is projected to grow steadily over the next 25 years, reaching 3,618,900 people by the year 2030. **Figure 1.1** illustrates medium population projections for Miami-Dade County based on 2004 calculations.

**Figure 1.1 Medium Population Projections for Miami-Dade County, 2010-2030**



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

Of particular concern within Miami-Dade County’s population are those persons with special needs and/or limited resources such as the elderly, disabled, low-income, or language-isolated residents. According to the 2000 U.S. Census, 13.3% of Miami-Dade County residents are listed as 65 years old or over, 21.0% are listed as having a disability, 18.0% are listed as below poverty, and 67.9% live in a home with a primary language other than English.



## 2. Hazard Vulnerability

### Hazards Identification

The following are natural hazards that pose a risk for the County as identified in the County's Local Mitigation Strategy (LMS): windstorms (including hurricanes, tropical storm, severe thunderstorms, tornadoes, and lightning), flooding, agricultural losses, drought, extreme heat, wildfires, and tsunamis. Appendix C of the LMS contains a matrix of vulnerabilities for each municipality and a risk assessment for each hazard the County faces. The matrix lists hurricane wind and surge, thunderstorm/lightning, tornadoes, and floods as high frequency events, agricultural and wildfire as medium, and drought, extreme heat, hard freeze, and tsunami as low.

Appendix D of the LMS includes a detailed list of historical disaster events dating back to 1891 and states Hurricane Andrew as causing \$30 billion in damages in 1992. Also, in October of 2000, Hurricane Irene resulted in 10 to 20 inches of rainfall in South Florida. There is an estimated 4.2 year return period for a severe flood in the region. (Miami-Dade County, 2005)

### Hazards Analysis

The following analysis looks at four major hazard types: hurricanes and tropical storms (specifically surge), flooding, sinkholes, and wildfire. All of the information in this section, except the evacuation and shelter estimates, 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 DMA2K revision project. It was created by Kinetic Analysis Corporation under contract with the Florida Department of Community Affairs (FDCA). Estimated exposure values were determined using the Category 3 Maxima Scenario for storm surge, the Federal Emergency Management Agency's (FEMA's) designated 100-year flood zones (A, AE, V, VE, AO, 100 IC, IN, AH), levels of concern 5 through 9 for wildfire, and high through adjacent risk zones for sinkholes. Storm surge exposure data are 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>) or your countywide LMS.

#### *Existing Population at Risk*

**Table 2.1** presents the estimated countywide population at risk from hazards, as well as a breakdown of the sensitive needs populations at risk. The first column in the table summarizes the residents of Miami-Dade County that live within FEMA Flood Insurance Rate Map zones that signify special flood hazard areas. According to these maps, 49.8% of the population, or 1,122,318 people, are within the 100-year flood zone. Approximately 37.5% of those at risk of flooding are disabled. These special-needs citizens require extra planning by local governments to ensure their safety. In Miami-Dade County, sinkholes are a minor risk and less than 1.0% of the population is within sinkhole zone. Wildfire is of some concern to the County, with 5.5% of the population living in medium- to high-risk wildfire zones, largely near the fringe of the metropolitan area. **Table 2.1** shows there are 366,225 people at risk from surge due to a Category 3 hurricane. Local emergency management officials likely would recommend that all of these residents at risk from surge evacuate or go to a County shelter. Out of those at risk from surge, there are 132,591 people with a disability, some of whom made need assistance from the local government in evacuating.

**Table 2.1 Estimated Number of Persons at Risk from Selected Hazards**

Population	Flood	Sinkhole (high-adjacent risk)	Wildfire (medium-high risk)	Surge
Minority	275,557	1,040	32,708	84,675
Over 65	149,674	67	17,374	59,486
Disabled	421,325	439	44,124	132,591
Poverty	185,295	95	18,483	61,396
Language Isolated	7,783	0	1,438	3,455
Single Parent	82,684	161	8,780	24,622
<b>Countywide Total</b>	<b>1,122,318</b>	<b>1,802</b>	<b>122,907</b>	<b>366,225</b>

Source: Florida Department of Community Affairs, 2005a.

*Evacuation and Shelters*

As discussed in the previous sections, population growth in Miami-Dade County has been steady, and this trend is projected to continue. As the population increases in the future, the demand for shelter space and the length of time it takes to evacuate the County is only going to increase. Currently, evacuation clearance times for Miami-Dade County are estimated to be 17.5 hours for Category 3, 4, and 5 hurricanes, as shown in **Table 2.2**. These data were derived from 11 regional Hurricane Evacuation Studies that have been produced by FEMA, the U.S. Army Corps of Engineers, and Florida Regional Planning Councils. The study dates range from 1995 to 2004 and are updated on a rotating basis. According to Rule 9J-5, counties must maintain or reduce hurricane evacuation times. Some experts have suggested that counties should try to achieve 12 hours or less clearance time for a Category 3 hurricane. This is due to the limited amount of time between the National Hurricane Center issuing a hurricane warning and when the tropical storm-force winds make landfall. Miami-Dade County is just over this recommendation now, but with continued growth and the limited evacuation options of the region, it will be difficult to maintain this evacuation time or reduce it. Additionally, storm events requiring evacuation typically impact larger areas, often forcing multiple counties to issue evacuation orders and placing a greater number of evacuees on the major roadways, further hindering evacuation progress. Thus, it is important to not only consider evacuation times for Miami-Dade County, but also for other counties in the region as shown in **Table 2.2**. Miami-Dade County’s location makes evacuation difficult as residents from the Keys are evacuating through the County and counties to the north may also be evacuating their citizens making for a huge traffic jam.

**Table 2.2 County Evacuation Clearance Times in Hours (High Tourist Occupancy, Medium Response)**

County	Hurricane Category				
	1	2	3	4	5
Broward	10.75	10.75	13.75	13.75	13.75
Miami-Dade	14	17.5	17.5	17.5	17.5
Monroe	18	18	36	36	36
Palm Beach	10.25	10.25	15.25	15.25	15.25

Note: Best available data as of 7/05

Source: State of Florida, 2005

(some counties may be in the process of determining new clearance times)

Coupled with evacuation is the need to provide shelters. If adequate space can be provided in safe shelters for Miami-Dade County residents, then this could be a partial solution to the ever-increasing clearance times for evacuation. Currently, the State Shelter Plan reports that there is

space for 90,958 people in the County’s shelters. The County currently has a surplus capacity of 30,958 spaces. It is projected that by 2009, shelter demand will increase as the population increases, but the County will still have a surplus of 36,182 spaces if shelter capacity is maintained. These additional spaces would likely accommodate Monroe County evacuees as well.

*Existing Built Environment*

While the concern for human life is always of utmost importance in preparing for a natural disaster, there also are large 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 recover from a disaster. **Table 2.3** presents estimates of the number of buildings in Miami-Dade County by structure type that are at risk from each of the four hazards being analyzed.

Flooding presents an enormous risk to property in the County, with 1,000,041 structures within a flood zone. Almost one third of those structures are single-family homes while another 35% are mobile homes. According to the latest National Flood Insurance Program Repetitive Loss Properties list, there are 1,801 homes in Miami-Dade County that have had flood damage multiple times and received insurance payments but have not remedied the recurring problem. There also are 176,374 structures at risk from surge, as shown in **Table 2.3**. Of those at risk from surge 66% are multi-family structures, most likely ocean-front condominiums.

**Table 2.3** also shows 3,497 structures within high to adjacent risk sinkhole areas which is not a lot when compared to those at risk from flooding. Wildfire is a threat to 57,590 structures in the County, 51% of which are multi-family homes. Typically, the dominant type of development found in potential wildfire areas is single-family homes and while there are 16,213 of them at risk, it is interesting to note that more urban development such as the multi-family structures is also at risk in Miami-Dade.

**Table 2.3 Estimated Number of Structures at Risk from Selected Hazards**

Structure Type	Flood	Sinkhole (high-adjacent risk)	Wildfire (medium-high risk)	Surge
Single-Family Homes	310,120	1,259	16,213	44,363
Mobile Homes	348,845	0	6,779	216
Multi-Family Homes	288,957	2,165	29,441	115,859
Commercial	37,108	67	2,769	13,652
Agriculture	10,328	4	522	1143
Gov./Institutional	4683	2	1866	1,141
<b>Total</b>	<b>1,000,041</b>	<b>3,497</b>	<b>57,590</b>	<b>176,374</b>

*Source: Florida Department of Community Affairs, 2005a.*

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 not only the people and property in a hazard area, but also the probability of occurrence that is necessary to understand the impacts to people and property. 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 in considering where to implement risk reducing comprehensive planning measures.

### Analysis of Current and Future Vulnerability

The previous hazards analysis section discussed population and existing structures at risk from flooding, sinkholes, wildfire, and surge according to MEMPHIS estimates. This section demonstrates the County's vulnerabilities to these hazards spatially and in relation to existing and future land uses. The following maps of existing land use within hazard areas are based on the 2004 Miami-Dade Property Appraiser's Office / Florida Department of Revenue data and the 1995 geographic information system (GIS) shapefiles from the Florida Department of Environmental Protection and the South Florida Water Management District. Maps of future land uses in hazard areas were developed using the Southwest Florida Regional Planning Council's future land use shapefiles obtained March 1994.

In **Attachment A**, four maps show the existing and future land uses within the coastal hazard zone (Category 1 storm surge zone) and the hurricane vulnerability zone (Category 1 evacuation zone). The coastal hazard zone (CHZ) primarily falls along the immediate coast line, the barrier islands outside of greater Miami, and along the southeastern most part of the county near Islandia and the Florida Keys. The hurricane vulnerability zone (HVZ) is generally located in the same area as the CHZ but also encompasses a large portion of the county south of Homestead. **Table 2.4** shows that 35,182 unincorporated acres are within the CHZ and 103,618 unincorporated acres are within the HVZ. Of these, 40.6% of the CHZ and 31.6% of the HVZ are currently vacant. An additional 44.8% of the CHZ and 39.8% of the HVZ is currently used for parks, conservation areas, and golf courses. Only 2.5% of the CHZ and 4.9% of the HVZ is used for residential purposes. The fact that population densities have been so limited by the County in such a prime location is really terrific. What is even better is that **Table 2.5** shows that of the undeveloped land in the CHZ and HVZ, 67.9% and 43.7%, respectively, are designated for future preserves and 15.2% and 40.8%, respectively, are designated for future agricultural purposes. Of course, the source of the tabulations in **Table 2.5** is not up to date and may not be an accurate reflection of what is currently on the Miami-Dade Future Land Use Map (FLUM). The County should do a similar analysis with their current FLUM (which was not available at the time of this analysis) to determine how vacant properties are designated and whether for the purposes of hazard mitigation if any changes should or could be made.

In **Attachment B**, two maps present the existing and future land uses within the 100-year floodplain. Almost the entire county is within a flood zone. Out of the 353,679 flood-prone acres shown in **Table 2.4**, 257,659 acres, or 72.8%, are currently in agricultural use, parks and conservation use, or they are vacant. There still are 30,872 acres of residential land use within the floodplain, though. As with the CHZ and HVZ, **Table 2.5** shows that a majority of the undeveloped flood-prone acres are designated for future agricultural or conservation use. These are ideal uses for land within the floodplain.

In **Attachment C**, maps present the land uses associated with high-risk wildfire zones. Small patches of wildfire-prone land are throughout the county but mostly west of Route 821. A larger wildfire risk zone that contains a lot of vacant land lies west of Miami Lakes and Hialeah Gardens and east of Route 997. There are also many small wildfire zones surrounding Homestead and Florida City. **Table 2.4** shows that 25,687 acres within Miami-Dade County are prone to wildfires. Of these wildfire susceptible acres, 38.5% are vacant, 24.8% are used for parks and conservation, 1.6% are used for government and institutional uses, and 10.2% are used for agriculture. Only 2.6% of land within the hazard zone is currently in residential use. **Table 2.5** shows that 75% of the currently undeveloped wildfire susceptible acres are designated for future agricultural use. As stated earlier, this data is most likely out of date and new future land use shapefiles would shed more light on how land in these hazard zones are really designated.



**Attachment D** includes maps of potential sinkhole areas in the County. Miami Dade County has a very limited amount of potential sinkhole areas. **Table 2.4** shows there are 746 acres with a potential for a sinkhole to occur. Only 36 acres are currently undeveloped. Single-family homes have already been built on 252 of these potentially hazardous acres and government and institutional uses along with transportation facilities are found on 286 acres. Of the undeveloped acres, **Table 2.5** shows them as all being slated for single-family residential or industrial use in the future.

**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	Potential Sinkhole Areas
Agriculture	Acres	741.5	9,300.4	50,268.5	2,608.3	1.6
	%	2.1	9.0	14.2	10.2	0.2
Attractions, Stadiums, Lodging	Acres	61.1	105.7	1,006.5	65.5	0.0
	%	0.2	0.1	0.3	0.3	0.0
Places of Worship	Acres	1.3	91.4	514.5	22.5	5.6
	%	0.0	0.1	0.1	0.1	0.8
Commercial	Acres	125.3	776.2	4,281.6	92.7	2.0
	%	0.4	0.7	1.2	0.4	0.3
Government, Institutional, Hospitals, Education	Acres	984.0	7,335.7	23,097.6	4,267.3	80.0
	%	2.8	7.1	6.5	16.6	10.7
Industrial	Acres	411.1	1,179.3	8,273.2	115.7	46.6
	%	1.2	1.1	2.3	0.5	6.3
Parks, Conservation Areas, Golf Courses	Acres	15,750.4	41,205.7	125,366.5	6,358.4	105.9
	%	44.8	39.8	35.4	24.8	14.2
Residential Group Quarters, Nursing Homes	Acres	1.1	21.4	89.6	1.3	0.0
	%	0.0	0.0	0.0	0.0	0.0
Residential Multi-Family	Acres	505.6	1,289.9	8,440.1	77.4	4.9
	%	1.4	1.2	2.4	0.3	0.7
Residential Mobile Home, or Commercial Parking Lot	Acres	130.4	441.4	1,151.9	42.1	4.5
	%	0.4	0.4	0.3	0.2	0.6
Residential Single-Family	Acres	230.5	3,009.8	21,280.0	548.6	252.4
	%	0.7	2.9	6.0	2.1	33.9
Submerged Lands (Water Bodies)	Acres	329.7	329.3	1,233.7	32.1	0.0
	%	0.9	0.3	0.3	0.1	0.0
Transportation, Communication, Rights-Of-Way	Acres	1,057.8	4,336.9	24,856.7	1,355.6	206.0
	%	3.0	4.2	7.0	5.3	27.6
Utility Plants and Lines, Solid Waste Disposal	Acres	585.0	1,462.0	1,794.4	203.5	0.0
	%	1.7	1.4	0.5	0.8	0.0
Vacant	Acres	14,267.3	32,732.8	82,024.2	9,895.6	36.1
	%	40.6	31.6	23.2	38.5	4.8
<b>Total Acres</b>	<b>Acres</b>	<b>35,182.1</b>	<b>103,617.9</b>	<b>353,679.0</b>	<b>25,686.6</b>	<b>745.6</b>
	<b>%</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

**Table 2.5 Total and Undeveloped Acres in Hazard Areas by Future Land Use Category for the Unincorporated County**

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas		Potential Sinkhole Areas	
		Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.
Agriculture	Acres	5,845.2	2,173.1	33,799.1	13,357.7	123,650.4	41,180.5	14,944.1	7,423.8	0.0	0.0
	%	16.6	15.2	32.6	40.8	35.0	50.2	58.2	75.0	0.0	0.0
Commercial	Acres	114.4	57.7	975.8	267.5	5,007.9	1,082.3	146.2	86.7	0.0	0.0
	%	0.3	0.4	0.9	0.8	1.4	1.3	0.6	0.9	0.0	0.0
Estate	Acres	848.7	534.6	1,604.4	612.6	9,401.2	1,318.0	540.2	125.5	0.0	0.0
	%	2.4	3.7	1.5	1.9	2.7	1.6	2.1	1.3	0.0	0.0
Federal Land	Acres	210.7	31.2	1,148.8	83.6	2,648.0	177.7	415.3	15.8	0.0	0.0
	%	0.6	0.2	1.1	0.3	0.7	0.2	1.6	0.2	0.0	0.0
Industrial	Acres	80.0	17.2	395.3	78.9	19,193.2	5,993.0	2,181.6	574.3	279.8	21.2
	%	0.2	0.1	0.4	0.2	5.4	7.3	8.5	5.8	37.5	58.7
Military	Acres	0.0	0.0	2,197.6	29.2	795.9	12.0	404.8	2.2	0.0	0.0
	%	0.0	0.0	2.1	0.1	0.2	0.0	1.6	0.0	0.0	0.0
Multi-Family	Acres	1,250.9	701.6	3,832.8	1,584.8	17,007.8	5,721.7	239.9	78.9	0.0	0.0
	%	3.6	4.9	3.7	4.8	4.8	7.0	0.9	0.8	0.0	0.0
Preserve	Acres	24,957.0	9,687.0	49,529.0	14,315.5	137,822.0	18,217.2	5,585.3	941.2	41.0	0.2
	%	70.9	67.9	47.8	43.7	39.0	22.2	21.7	9.5	5.5	0.6
Single Family	Acres	1,875.3	1,064.9	10,135.1	2,403.0	35,883.9	6,728.7	1,192.0	620.4	424.7	14.7
	%	5.3	7.5	9.8	7.3	10.1	8.2	4.6	6.3	57.0	40.7
Water Bodies	Acres	0.0	0.0	0.0	0.0	2,268.8	1,593.1	37.5	26.8	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.6	1.9	0.1	0.3	0.0	0.0
<b>Total</b>	<b>Acres</b>	<b>35,182.1</b>	<b>14,267.3</b>	<b>103,617.9</b>	<b>32,732.8</b>	<b>353,678.9</b>	<b>82,024.2</b>	<b>25,686.9</b>	<b>9,895.6</b>	<b>745.5</b>	<b>36.1</b>
	<b>%</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

**Table 2.6** presents the total number of acres in a hazard zone in Miami-Dade County’s incorporated areas and how many of those acres are currently undeveloped. Only 6 of the 27 municipalities in Miami-Dade County are outside of the HVZ and the CHZ. Coral Gables, the City of Miami, Miami Beach, North Miami and Key Biscayne all have significant acreage in these zones. Other coastal communities have a smaller total land mass, but are within the zones and subject to storm surge and hurricane force winds. **Table 2.6** shows that only 1,957 acres in the CHZ are vacant. The HVZ is significantly larger, totaling 26,221 acres, and of those 4,427 acres are currently vacant. Every jurisdiction except Biscayne Park has some amount of vacant acreage in either the CHZ or HVZ, leaving each some opportunity to address hazard mitigation issues before development occurs.

Every municipality has some portion of land within a flood zone. Incorporated land within the 100-year floodplain totals 73,981 acres, 9,174 acres of which are vacant. Coral Gables, Hialeah, Homestead, the City of Miami, Miami Beach, Miami Lakes, North Miami, and Pinecrest all have a considerable amount of land within flood zones. No community in Miami-Dade County has a large concentration of wildfire susceptible land. Homestead contains 231 acres of wildfire susceptible land, followed by Miami with 185 acres. Out of the 998 incorporated acres in wildfire susceptible areas, only 320 acres are currently vacant.

Table 2.6 Total and Vacant Incorporated Acres in Hazard Areas

Jurisdiction		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant
Bal Harbour	Acres	255.7	61.3	225.4	61.1	222.3	48.4	0.0	0.0
	%	100.0	24.0	100.0	27.1	100.0	21.8	0.0	0.0
Bay Harbor Islands	Acres	288.0	56.2	265.7	59.1	386.3	56.6	0.0	0.0
	%	100.0	19.5	100.0	22.2	100.0	14.7	0.0	0.0
Biscayne Park	Acres	5.8	0.0	0.0	0.0	374.3	3.8	0.0	0.0
	%	100.0	0.0	0.0	0.0	100.0	1.0	0.0	0.0
Coral Gables	Acres	2,713.7	263.3	3,366.7	296.5	7,057.3	344.4	145.6	10.5
	%	100.0	9.7	100.0	8.8	100.0	4.9	100.0	7.2
El Portal	Acres	29.0	0.7	0.0	0.0	117.5	3.3	0.0	0.0
	%	100.0	2.3	0.0	0.0	100.0	2.8	0.0	0.0
Florida City	Acres	20.5	5.8	572.0	312.5	2,066.6	655.9	33.9	21.0
	%	100.0	28.3	100.0	54.6	100.0	31.7	100.0	61.8
Golden Beach	Acres	194.4	16.1	183.9	16.1	202.0	15.8	0.0	0.0
	%	100.0	8.3	100.0	8.7	100.0	7.8	0.0	0.0
Hialeah	Acres	0.0	0.0	24.7	5.1	6,643.5	1,000.1	16.1	2.9
	%	0.0	0.0	100.0	20.7	100.0	15.1	100.0	18.1
Hialeah Gardens	Acres	0.0	0.0	0.0	0.0	1,619.4	431.4	95.6	49.7
	%	0.0	0.0	0.0	0.0	100.0	26.6	100.0	52.0
Homestead	Acres	0.0	0.0	6,164.0	1,760.7	8,652.4	2,127.6	231.0	94.5
	%	0.0	0.0	100.0	28.6	100.0	24.6	100.0	40.9
Indian Creek	Acres	260.8	22.1	257.9	21.8	159.2	18.7	2.9	0.7
	%	100.0	8.5	100.0	8.5	100.0	11.8	100.0	23.1
Key Biscayne	Acres	767.8	238.5	766.4	238.3	885.9	251.2	0.0	0.0
	%	100.0	31.1	100.0	31.1	100.0	28.4	0.0	0.0
Medley	Acres	0.0	0.0	0.0	0.0	2,644.6	1,235.7	5.3	3.6
	%	0.0	0.0	0.0	0.0	100.0	46.7	100.0	66.7
Miami	Acres	3,133.5	392.1	5,393.6	653.4	16,827.0	846.0	185.3	51.7
	%	100.0	12.5	100.0	12.1	100.0	5.0	100.0	27.9
Miami Beach	Acres	4,828.7	479.1	4,607.7	474.6	9,697.0	481.8	3.3	0.0
	%	100.0	9.9	100.0	10.3	100.0	5.0	100.0	0.0
Miami Lakes	Acres	0.0	0.0	0.0	0.0	3,348.4	595.9	125.1	74.5
	%	0.0	0.0	0.0	0.0	100.0	17.8	100.0	59.5
Miami Shores	Acres	86.1	6.9	298.9	20.5	1,099.9	18.9	0.0	0.0
	%	100.0	8.0	100.0	6.9	100.0	1.7	0.0	0.0
Miami Springs	Acres	0.0	0.0	63.1	4.0	1,246.6	18.9	0.0	0.0
	%	0.0	0.0	100.0	6.4	100.0	1.5	0.0	0.0
North Bay Village	Acres	257.0	43.0	239.4	43.0	537.0	43.7	0.0	0.0
	%	100.0	16.7	100.0	18.0	100.0	8.1	0.0	0.0
North Miami	Acres	1,651.7	9.1	2,299.5	75.1	4,003.2	120.4	19.8	0.0
	%	100.0	0.6	100.0	3.3	100.0	3.0	100.0	0.0
North Miami Beach	Acres	329.9	77.4	451.0	99.2	1,057.8	260.6	10.5	0.0
	%	100.0	23.4	100.0	22.0	100.0	24.6	100.0	0.0

Table 2.6 Total and Vacant Incorporated Acres in Hazard Areas

Jurisdiction		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant	Total	Vacant
Opa-locka	Acres	0.0	0.0	0.0	0.0	1,320.6	251.2	45.0	2.9
	%	0.0	0.0	0.0	0.0	100.0	19.0	100.0	6.4
Pinecrest	Acres	34.3	0.2	105.4	3.3	1,995.4	71.6	78.2	7.6
	%	100.0	0.6	100.0	3.2	100.0	3.6	100.0	9.7
South Miami	Acres	0.0	0.0	0.0	0.0	594.1	26.8	0.0	0.0
	%	0.0	0.0	0.0	0.0	100.0	4.5	0.0	0.0
Sunny Isles Beach	Acres	616.4	251.0	606.1	248.6	811.7	224.9	0.0	0.0
	%	100.0	40.7	100.0	41.0	100.0	27.7	0.0	0.0
Surfside	Acres	337.5	33.9	329.5	33.9	376.3	19.2	0.2	0.0
	%	100.0	10.0	100.0	10.3	100.0	5.1	100.0	0.0
Virginia Gardens	Acres	0.0	0.0	0.0	0.0	35.4	1.3	0.0	0.0
	%	0.0	0.0	0.0	0.0	100.0	3.8	0.0	0.0
<b>Total Acres</b>	<b>Acres</b>	<b>15,810.9</b>	<b>1,956.7</b>	<b>26,221.2</b>	<b>4,426.9</b>	<b>73,981.8</b>	<b>9,174.2</b>	<b>997.8</b>	<b>319.5</b>
	<b>%</b>	<b>100.0</b>	<b>12.4</b>	<b>100.0</b>	<b>16.9</b>	<b>100.0</b>	<b>12.4</b>	<b>100.0</b>	<b>32.0</b>

### 3. Existing Mitigation Measures

#### Local Mitigation Strategy

The LMS is an ideal repository for all hazard mitigation analyses, policies, programs, and projects for the County and its municipalities due to its multi-jurisdictional and intergovernmental nature. The LMS identifies hazard mitigation needs in a community and structural or non-structural initiatives that can be employed to reduce community vulnerability. Communities can further reduce their vulnerability to natural hazards by integrating the LMS analyses and mitigation objectives into their Comprehensive Plans.

An LMS prepared pursuant to the State’s 1998 guidelines has three substantive components (FDCA, 2005b):

Hazard Identification and Vulnerability Assessment (HIVA). 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 the community is susceptible to. According to FEMA, LMSs 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, 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 monetary 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. The Guiding Principles typically contain 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 Post-Disaster Redevelopment Plans (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 LMS Goals and Objectives will guide the priority of the mitigation initiatives.

The Miami-Dade County LMS (updated in 2005) was used as a source of information in developing this profile and was also reviewed for any enhancements that could be made to allow better integration with other plans, particularly the local Comprehensive Plans.

*Hazard Identification and Vulnerability Assessment*

This section of the LMS was briefly reviewed for its ability to provide hazard data that can support comprehensive planning. The LMS contains a general description of the hazards that pose a risk to the County, primarily windstorms and floods. Appendix C provides a matrix that includes hazard vulnerabilities by municipality, a risk assessment by hazard for the County, and a list of data sources for vulnerability and risk. Appendix D contains tables of past cyclone systems over South Florida as well as flooding events. Appendix E contains maps depicting the flood zone, evacuation zones, and flammable natural areas in relation to major roads. The vulnerability of structures is indirectly addressed in the LMS. It states that repetitive loss data is maintained in a database managed by the Miami-Dade County Department of Environmental Resources. The LMS also indicates that the Miami-Dade County Office of Emergency Management maintains an inventory of critical facilities including GIS location data, although these are not included in the LMS itself. Information and data used to analyze potential losses to the economy, environmental resources, or structures were not found during this review. (Miami-Dade County. 2005)

*Guiding Principles*

The Guiding Principles section of the Miami-Dade County Local Mitigation Strategy provides a list of federal, state, regional, and municipal government entities as well as their overall mitigation functions. This section lays out the general structure of hazard mitigation responsibilities for each entity. The LMS also includes a section titled *Policies, Ordinances, and Programs Affecting Mitigation* that lists federal, state, county, and municipal laws, programs, and plans that direct hazard mitigation efforts. A list of existing goals, objectives, and policies from other relative documents was not found during this review. Including an inventory in the LMS can help provide an overall framework of existing mitigation policy and can highlight where more integration between plans needs to be done. (Miami-Dade County. 2005)

*LMS Goals and Objectives*

The LMS Goals and Objectives can be found in **Attachment E**. The following is a summary of how well the LMS has addressed mitigation issues that coincide with planning concerns. Goals address the general protection of persons and property in the county, the implementation of mitigation activities, repetitive loss properties, involvement in the Community Rating System, dissemination of flood hazard information, emergency preparedness and response capacity, intergovernmental coordination, and implementation of the LMS. Several objectives call for the protection and maintenance of critical and vital facilities as well as evacuation routes and emergency equipment. Other objectives focus on structural mitigation strategies including window and door provisions, building setbacks, the retrofitting of structures, correcting stormwater problems, and the mitigation of problems related to low lying base elevations. One objective calls

for the enhancement of public information and awareness of hazards. Overall, the goals and objectives focus on the build environment and the efforts of government agencies to carry out mitigative initiatives. The location of future development within the County is not included in the goals and objectives of the LMS. Also, the LMS does not mention the use of the Comprehensive Plan as a means of implementing some LMS goals and objectives. (Miami-Dade County. 2005)

### **Comprehensive Emergency Management Plan**

The Mitigation Annex of the 2003 Miami-Dade County CEMP was reviewed for consistency with the other plans. It is simply a one page document that refers to the LMS for hazard mitigation planning. It offers no additional information of use to emergency managers or planners besides deferring all mitigation information to the LMS.

### **Post-Disaster Redevelopment Plan**

A PDRP for Miami-Dade County was not available for review at the time this profile was drafted. If Miami-Dade County has a current PDRP, this will be obtained and reviewed for the final version of this document.

### **National Flood Insurance Program/Community Rating System**

Miami-Dade County and all of the incorporated municipalities participate in the National Flood Insurance Program. In addition, Miami-Dade County participates in the Community Rating System and has a current class of 5. Fifteen municipalities also participate in the Community Rating System.

## **4. Comprehensive Plan Review**

Miami-Dade County's Comprehensive Development Master Plan (amended in 2001) was reviewed in order to see what the County has already done to integrate their LMS policies, and hazard mitigation in general, into their planning process. A list of the goals, objectives, and policies currently in the plan that contribute to hazard mitigation is found in **Attachment F**

Overall, the CDMP provides a wide array of hazard mitigation policies that address both structural and non-structural ways to reduce risks to persons and property. The policy framework provides a proactive strategy for addressing hazard mitigation needs through public acquisition of land, ensuring safe evacuation routes and procedures, protection of the natural environment, addressing sheltering needs, supporting a redevelopment plan that enforces improved development practices after hurricane damages occur, educational programs, structural reinforcement of public and private buildings, as well as other techniques.

### **Coastal Hazards**

There are numerous policies that aim to conserve, protect, and restore coastal resources that provide protection from natural disasters including barrier islands, estuarine waters, shorelines, coastal wetlands, mangrove areas and other coastal vegetation, beaches and dunes, and offshore reefs. The County also has many policies that promote public acquisition of shoreline areas, enforce shoreline building codes and setbacks, regulate port activities and practices, aim to limit development in coastal areas, and steer development away from the CHHA.

### **Flooding Hazards**

There are many policies that aim to protect and restore natural drainage features and water bodies. Flood hazards are addressed through development regulations, stormwater master plans, implementation of a stormwater management level of service standard, a flood protection level of service standard, and through enforcement of building codes. Also, several policies promote the public acquisition of wetlands.

### **Wildfire Hazards**

There is one policy that directly addresses wildfire mitigation through controlled burning in the CDMP. Other policies promote water conservation, which indirectly addresses wildfire mitigation since reserved water can be used for suppression and water conservation may decrease the severity of drought conditions.

### **Sinkhole Hazards**

There were no policies during this review that directly address sinkhole hazards.

### **Other Hazard Mitigation Policies**

There are many goals, objectives, and policies that address hazard mitigation in the CDMP. There are policies that support the LMS, PDRP, and water management plans. Policy 10B of the Coastal Management Element promotes the inclusion of hazard mitigation proposals in the CDMP. Like the LMS, the CDMP has policies that promote emergency preparedness and hurricane evacuation and sheltering programs. There are many policies that address evacuation routes, evacuation procedures, the use of busses to evacuate transit-dependent people, evacuation of special needs persons, and promote enhancement of emergency communication systems on roadways and infrastructure in the CHHA. Policies also address sheltering. Policy 10C of the Housing Element addresses shelters for displaced low-income persons. One policy promotes the use of safe rooms while another addresses shelters in mobile home parks. There is also a policy that promotes coordination and cooperation between the private and public sector, as well as across jurisdictional lines.

## **5. Recommendations**

For the LMS to be effective in the decision-making process of growth management, its objectives and policies must be integrated into the CDMP. The Plan is the legal basis for all local land use decisions made. If hazard mitigation is to be accomplished beyond the occasional drainage project, these hazards must be addressed in comprehensive planning, where development can be limited or regulated in high-risk hazard areas just as sensitive environments are routinely protected through growth management policies. Mitigation of hazards is considerably easier and less expensive if done when raw land is being converted into development. Retrofitting structure and public facilities after they have been built is significantly more expensive. However, if older neighborhoods or communities are scheduled to be revitalized or redeveloped, hazard mitigation needs to be an aspect considered and integrated into the project prior to the time of development approval.

Miami-Dade County has begun this process of integrating hazard mitigation throughout its Plan's elements. The prior section summarized how the major hazards for the County have been for the most part well-addressed. There is, however, still some disconnection between the LMS objectives and initiatives, and the policies in the Comprehensive Plan. By tightening the connection between these documents, the County will find it easier to implement hazard mitigation, and there will be higher awareness of these issues within more departments of the

County government. **Table 5.1** presents options for further integration as well as the basis for these recommendations.

NOTE: The recommendations set out in this section are only suggestions. Through the workshop process and contact with the local governments, the goal of this project is to result in specific recommendations tailored and acceptable to each county. While the profile addresses hurricanes, flooding, wildfire, and sinkholes, the County should consider other hazards, if appropriate, such as tornadoes and soil subsidence, during the update of the local Comprehensive Plan.



**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
<b>Strategy 1 - Collaboration, coordination, and education</b>					
<p><b>a) Is there information sharing &amp;/or involvement in plan development between planners &amp; emergency managers?</b></p>	<p>O (14) 11. Initiate organizational, managerial and administrative goals to make mitigation a mainstream function of government affairs; spread the responsibilities throughout many departments and agencies to ensure continuity and a full integration of mitigation management functions in the operations of government.</p>	<p>CME P10F Use GIS that delineates CHHA and HVZ, use across agencies ICE P4F Coordinate information in CDMP with SFWMD ICE P8C Dept of Planning and Zoning, Office of Emergency Management shall increase interaction and coordination of emergency management</p>			
<p><b>b) Do the Comp Plan, LMS, CEMP, &amp; other local and regional plans cross-reference each other &amp; include consistent data on hazardous locations?</b></p>	<p>G 7. To increase the level of coordination of mitigation management concerns, plans and activities at the municipal, county, state and federal levels of government.</p>	<p>FLUE P3E Develop integrated land use and water management plans to address runoff, flood control, and water supply CME O10 Support pre-disaster mitigation measures CME P10A By 2000 complete a post disaster redevelopment plan CME P10B Include pre-disaster hazard mitigation proposals in the Comprehensive Development Master Plan CME P11A Implement the County's Hazard Mitigation and Post Disaster Redevelopment Plan ICE P4F Coordinate information in CDMP with SFWMD</p>			
<p><b>c) Are hazard mitigation projects addressed in the 5-year schedule of Capital Improvement Projects?</b></p>		<p>ROSE O5 Maintain a formal capital improvements planning program that expands park and recreation system through acquisition of land, restoration and renovation of facilities and natural areas ROSE P5A Prioritize capital improvements expenditure with criteria involving preservation of natural, historic, and cultural resources / high resource values such as shorelines CME P10B Include pre-disaster hazard mitigation proposals in the Comprehensive Development Master Plan</p>			

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
<p><b>d) Are there measures to educate residents, homeowner/property associations, &amp; the business community of ways they can mitigate against hazards?</b></p>	<p>G 5. Increase the continual dissemination of information on a repetitive basis with respect to the existence of flood hazards and the availability of measures to mitigate the problems presented by such hazards.O (13) 10. Enhance public information and involvement and increase the public awareness of hazards and problems and educate the public through a widespread program of general information, media coverage and participatory involvement.</p>	<p>CME P8C Hurricane evacuation and shelter education program for homeowners, hotels, motels, time-share condo's in coastal areas/ emergency preparedness procedures.CME P8D Promote citizen preparednessICE 8E Promote coordination of fed, state and regional agencies / public information and public awareness programs</p>			
<p><b>Strategy 2 - Get out of the way: provide evacuation and sheltering services</b></p>					
<p><b>a) Are there measures to provide adequate evacuation clearance time to support current population and population growth?</b></p>	<p>O 2. Protection of expressways, major highways and other thoroughfares and, more importantly, our bridges and causeways to provide for continuous, free flowing traffic and circulation as needed for the effective and unencumbered provision of emergency services and evacuation operations.</p>	<p>FLUE P3D County will not support development of barrier islands. Evacuation of barrier islands a priority of transportation planning and hurricane preparedness plans TE P4D Ensure evacuation of barrier islands CME O8 Provide evacuation routes and evacuation shelter CME 8A Annually review and update hurricane evacuation procedures section of it's emergency operation plan. CME P8F Maintain existing evacuation period CME P8G Keep evacuation routes up-to-date CME P8H Transportation Improvements Program to include evacuation routes CME P8I Use busses to evacuate people without cars CME P8J Maintain list of people with special needs to evacuate CME P8O Remove trees susceptible to tropical force winds near evacuation routes ICE P8A Encourage jurisdictions to develop an emergency communications system on roadways</p>	<p>The County could adopt a policy in the Capital Improvements Element that establishes a level-of-service standard for evacuation clearance times. Also, the County could adopt or amend policies so they aim to improve evacuation times.</p>		<p>Table 2.2 shows that it would take 17.5 hours to safely evacuate the County in a Category 2 or higher hurricane. Currently, there are policies that address many aspects of evacuations, but no policy aims at improving evacuation times. Improving evacuation times could help ensure the safety of many County residents, including the 132,891 disabled people that are at risk from hurricane surge, as shown in Table 2.1 of this report. Also, having a level-of-service standard in the CDMP can help ensure infrastructure is present before development occurs.</p>

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
		CIE P2B Replacement of infrastructure in (CHHA) to improve evacuation times, mitigate storm damage			
<p><b>b) Are there measures to provide adequate shelter space to meet population growth and special needs?</b></p>		<p>HE P 10C Assure suitable emergency shelter for low income persons displaced by natural disasters                      CME P8K Coordinate expansion of shelter capacity to accommodate 2000 projection of hurricane evacuees fro Dade and Monroe Counties                      CME P8L Explore private owned building for public shelters                      CME P8M Promote safe rooms                      CME P8N No mobile home parks in coastal flooding areas; mobile home parks outside areas subject to coastal flooding shall have evacuation shelters                      ICE O8 Ensure shelter within the region                      ICE 8D Encourage jurisdictions to coordinate and designate shelter locations</p>	<p>Coastal Management Element Policy 8K can be amended to accommodate the 2015 projection of hurricane evacuees from Dade and Monroe County.</p>	<p>The LMS could be amended to include a goal that aims to provide adequate emergency shelter space based on the State Shelter Plan or other more rigorous internal studies.</p>	<p>Creating a goal in the LMS that focuses on evacuation shelter can improve the overall hazard mitigation strategy by keeping sheltering needs in the forefront of hazard mitigation in Dade County. There are currently many strong evacuation shelter policies in the Comprehensive Plan that utilize a range of techniques including private and public partnerships, promotion of safe rooms, and coordination between jurisdictions to provide shelters. These policies can be amended to shift the focus to accommodating future populations, since shelter demand will undoubtedly increase as development occurs in Dade County.</p>

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
<b>Strategy 3 - Make the environment less hazardous: Protect and enhance natural protective features</b>					
<p>a) Are there measures to protect and/or restore natural resources that might in turn decrease the risk from natural hazards?</p>		<p>Natural Resources            FLUE O3 Development practices to ensure the protection of natural resources and the natural environment            FLUE P3A Development orders consistent with applicable environmental regulations.            FLUE P3B Protection of natural resources            FLUE P3C Protection of the Everglades            FLUE P8A Restrict development to avoid natural resource degradation            TE O6 Plan transportation systems that preserve environmentally sensitive areas and natural resources            TE P6B Limit access to environmentally protected areas            ASE O6 Maximize compatibility of aviation facilities and the natural environment            ASE P6A Locate facilities to avoid impacts to natural environment and natural resources            PMMPSE GB Port operations to minimize detrimental effects to the environment            PMMPSE O4 Port shall promote strong environmental practices            PMMPSE P4A Port shall review environmental practices            PMMPSE P4C Port shall explore mitigation banking            CARDE O6 Protect soils and mineral resources            WSSWE G Protect natural environment            ROSE O6 Maintain comprehensive resource management program for acquisition of environmentally sensitive lands, coastal areas, and historic sites            ICE P4C Continue cooperation with state and federal agencies to manage environmentally sensitive East Everglades</p>		<p>LMS goals and objectives can promote the continual conservation and management of the environment.</p>	<p>Currently, there are no goals or objectives in the LMS that promote environmental protection. Adding a goal or an objective to the LMS could promote conservation, land acquisition, and resource management practices that protect the environment as well as the additional benefits natural resources provide for hazard mitigation, including absorption of wave impact, erosion control, wildfire management, and natural drainage features.</p>



**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
		<p>WetlandsFLUE P9N Enhance regulations that govern development of flood prone areas, ESL, and stormwaterCARDE G1 Protect natural resources, drainage featuresCARDE P 4a Protect wetlandsCARDE O5 Continue to implement stormwater master plansCARDE P5A Enforce stormwater management LOS, enforce flood protection LOS, enforce minimum floor elevations.CARDE P5E Stormwater drainage and aquifer recharge improvement priority criteria based on evacuation routes and the number of structures at risk.CARDE O7 Protect wetlands through mitigation and public acquisition, restoration, and managementCARDE P7A Limit degradation of wetlandsCARDE P7B Prohibit off-road vehicles in wetlandsCARDE P7C Promote restoration of wetlandsCARDE P7E Give high priority to wetlands acquisition sitesCARDE P7G Continue to work with federal, state, regional, and local acquisition agencies to development wetland basin management plans.CME G1 Protect natural and historic resources; limit public expenditures subject to natural disasters; protect human life in coastal areas</p>	<p>Existing Comprehensive Development Master Plan policies that promote the conservation and acquiring of natural resources could be amended to include hazard mitigation as an added benefit.</p>		<p>Currently, there are many policies that promote the management and protection of natural resources, wetlands, coastal resources, soils, and environmentally sensitive areas, but hazard mitigation is not included as a benefit to these efforts. Natural resources such as coastal vegetation and barrier islands absorb the impact of storm surge that otherwise could damage coastal development. The natural drainage features of wetlands and water bodies provide stormwater drainage. Adding hazard mitigation as a benefit to Comprehensive Development Master Plan policies can illustrate the importance of environmental protection as well as the protection of lives and property.</p>
		<p>WildfireCARDE 8F County shall continue to seek natural areas land management fund to conduct controlled burns, remove exotic pest plant species.WSSWE O5 Implement water conservation programWSSWE P5D Promote educational program for residential, commercial, and industrial consumers to discourage waste and conserve water</p>			<p>The County could explore the services provided by the Department of Forestry to address wildfire mitigation. Educational information, controlled burn services, and land management recommendations from the Department of Forestry could be used to address wildfire prone areas before development occurs. The analysis in Section 2 and the maps in Attachment C of this report suggests, future development may encroach on wildfire hazard areas adjacent to Route 997. Addressing wildfire threats near residential areas can help prevent loss of property and life.</p>

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
		<p>Coastal ResourcesFLUE P3D County will not support development of barrier islands. Evacuation of barrier islands a priority of transportation planning and hurricane preparedness plansPMRSE O3 Minimize impacts to estuarine waters and marine resourcesPMRSE P3B Stabilize all eroding County owned shoreline areaROSE P3C Through park and recreation programs, the County shall preserve and protect beaches and shores and maximize public ownership of these coastal resourcesCME O1 Protect coastal wetlandsCME P1A Establish mangrove protective areasCME P1B Restore natural surface water flow through coastal wetland systemsCME P1C Minimize impact to shorelines / wetland vegetationCME P1D Protect mangrove forestsCME P1E Create, restore coastal wetlandsCME P1F Replant mangroves and marsh grassesCME O2 Protect beaches dunes offshore reefsCME P2A Protect offshore grass flats and dune vegetationCME P2B Stabilize beachesCME P5C Prioritize acquisition of coastal lands for use as parks and preservesCME P5F Siting of water dependent facilities based on shore line characteristics, vegetation; provide hurricane contingency plan.CME O6 Preserve traditional shoreline use / minimize impacts of man-made structures and activities on coastal resourcesCME P7B Promote public education of coastal resourcesCME P7D Replant native vegetation</p>			

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
<b>Strategy 4 - Make structures more resistant to natural hazard forces</b>					
<p><b>a) Are there measures that support relocating or retrofitting private &amp;/or public structures in hazard areas?</b></p>	<p>O 8. Reduction and mitigation of storm surge hazards and effects by encouraging greater setbacks from shorelines for new developments of waterfront properties, encouraging retrofitting and elevation of structures with high priority consideration for those built on waterfront properties, seeking opportunities to acquire, exchange or otherwise secure limited control of waterfront real estate.O 10. Reduction and mitigation of problems from structures built below base flood elevation (BFE).</p>	<p>ROSE P5C Renovate, restore, upgrade county facilities / provide storm protection to walls, windows, and doors/ provide long-term suitability and integrity for natural, historic, and archeological resourcesROSE P6B Provide long-term viability and integrity to natural, historic or archeological resourcesCME P10E Pre-disaster planning to determine the feasibility of relocating public buildings and infrastructure away from the CHHACME P10C Identify funds to reconstruct, relocate, or construct new public building and infrastructure outside the CHHA</p>		<p>The County could include a goal or objective in the LMS that aims to relocate existing public facilities away from natural hazard areas, as suggested by Comprehensive Development Master Plan policy 10E of the Coastal Management Element.</p>	<p>Including a goal or an objective in the LMS could act as a vehicle to reach the Comprehensive Development Master Plan strategy of protecting public facilities.</p>
<p><b>b) Are there measures to require compliance with or exceed building codes &amp;/or design standards for certain hazard areas?</b></p>	<p>G 3. To prevent additional repetitive loss properties. To reduce the number of repetitive loss properties.G 4. To assure incremental improvements in municipalities' standing and classification in the Community Rating System (CRS).O 1. To follow the mitigation recommendations espoused in the FEMA publication Building Performance: Hurricane Andrew in Florida, a document that dramatically sets forth the many deficiencies brought to light by Hurricane Andrew.O 5. Addition of building envelope protection – including window and door protection – and inclusion of a continuous load path from roof to foundation on all structures within the county.O 6. Reduction or mitigation of low points in the</p>	<p>FLUE P8A Restrict development to avoid natural resource degradationFLUE P9N Enhance regulations that govern development of flood prone areas, ESL, and stormwaterHE P7B Use development review procedures to reduce or eliminate adverse environmental impactsCME P10D Rezoning, variances, or subdivision approvals in surge areas to be reviewed for evacuation, sheltering, hazard mitigation, and post disaster recovery.</p>	<p>The County could add a policy to the Comprehensive Development Master Plan that aims to eliminate future repetitive loss properties and mitigate existing repetitive loss properties.</p>		<p>The analysis in Section 2 of this report shows there are 1,801 structures in Miami-Dade County that have had repetitive damage but have not been mitigated. Goal 3 of the Local Mitigation Strategy provides a mitigative goal to reduce and eliminate repetitive loss properties. Including a policy in the Comprehensive Development Master Plan can strengthen this strategy and promote countywide initiatives to reduce structure damage.</p>

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
	<p>county's or cities' topography; specifically to encourage the flow of storm water away from structures and toward streets where storm drainage systems are concentrated and to eliminate or modify surfaces that would otherwise drain toward these low points. O 8. Reduction and mitigation of storm surge hazards and effects by encouraging greater setbacks from shorelines for new developments of waterfront properties, encouraging retrofitting and elevation of structures with high priority consideration for those built on waterfront properties, seeking opportunities to acquire, exchange or otherwise secure limited control of waterfront real estate.</p>				

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
<p><b>c) Are there measures to protect cultural resources from natural disasters?</b></p>		<p>FLUE O6 Protect historic resources            FLUE P6I Support County's historic preservation ordinance            CARDE P7D Protect natural and historic resources through management plans            ROSE G Offer recreational experiences while preserving and protecting valuable natural, historic and cultural resources            ROSE P5A Prioritize capital improvements expenditure with criteria involving preservation of natural, historic, and cultural resources / high resource values such as shorelines            ROSE P5C Renovate, restore, upgrade county facilities / provide storm protection to walls, windows, and doors/ provide long-term suitability and integrity for natural, historic, and archeological resources            ROSE O6 Maintain comprehensive resource management program for acquisition of environmentally sensitive lands, coastal areas, and historic sites            ROSE P6B Provide long-term viability and integrity to natural, historic or archeological resources            CME G1 Protect natural and historic resources; limit public expenditures subject to natural disasters; protect human life in coastal areas            CME P11G Post disaster redevelopment to improve evacuation route capacity            CME O12 Protect, preserve, and reuse historic resources in coastal area            CME P12C Improve protection of historic resources from damage caused by natural disasters through pre and post storm hazard mitigation measures and code enforcement</p>		<p>The County could include a goal or an objective to the LMS that aims to protect cultural resources, much like those found in the Comprehensive Development Master Plan.</p>	<p>There are strong policies in the Comprehensive Development Master Plan that aim to protect cultural, historic, and archeological resources in the county through acquisition, restoration, improvements to structural integrity, and code enforcement. Adding a goal to the LMS that aims to protect cultural resources could help strengthen this strategy.</p>

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
<b>Strategy 5 - Manage the development and redevelopment of land in hazardous areas</b>					
<p><b>a) Are there measures to limit population densities in high-hazard areas?</b></p>		<p>CME O9 Direct populations away from CHHA; limit public expenditures in CHHA                      CME P9A Limit development activities in CHHA; discourage development of barrier islands; prohibit new mobile home parks in CHHA; maintain densities                      CME P9B Restrict development in CHHA                      CME P9C Consider undeveloped land susceptible to storm surge for public recreational uses and open space.                      CME P9D Prohibit critical care facilities / vital public facilities in CHHA                      CME P9F Prohibit public expenditures that subsidize infrastructure and encourages additional population growth in the CHHA                      CME P11E County to give priority to public acquisition of properties in the HVZ; CHHA                      CIE O2 Limit development in high hazard coastal areas to permitted levels</p>	-	<p>The County could add a goal into the LMS that seeks to limit populations and development in high hazard areas including the Coastal High Hazard Area.</p>	<p>The County currently has many goals in the Comprehensive Development Master Plan that aim to do this but no goal is included in the LMS. Including such a goal into the LMS could help reduce the number of people and structures at risk from natural disasters across jurisdictional lines. Also, including this goal could help strengthen the overall hazard mitigation strategy for the region.</p>
<p><b>b) Are there measures to limit public expenditures that subsidize development in high-hazard areas?</b></p>		<p>TE P6A Avoid transportation improvements which encourage development in CHHA or environmentally sensitive areas                      CME G1 Protect natural and historic resources; limit public expenditures subject to natural disasters; protect human life in coastal areas                      CME P9F Prohibit public expenditures that subsidize infrastructure and encourages additional population growth in the CHHA                      CIE P2A Restrict public funds from subsidizing increased overall density or intensity of dev in (CHHA)</p>		<p>The County could include a goal or objective that aims to limit public expenditures in high-hazard areas.</p>	<p>Currently, there are policies in the Comprehensive Development Master Plan that restrict or prohibit public expenditures in the CHHA. Including a goal in the LMS could strengthen the strategy of steering development away from hazard areas as well as limiting the amount of County investment at risk from natural disasters.</p>



**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami-Dade County's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current LMS Information, Goals, or Objectives	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Options for Enhancement of the LMS	Basis For Suggested Options
<p><b>c) Are there creative neighborhood design solutions or development regulations that mitigate hazards, such as clustering or transfer of development rights?</b></p>					
<p><b>d) Are there measures to limit redevelopment in hazard areas and procedures for post-disaster recovery that will lead to a more disaster-resistant community?</b></p>		<p>CME O11 Implement hazard mitigation and post disaster redevelopment plan and applicable CDMP to reduce future loss of life and property                      CME P11A Implement the County's Hazard Mitigation and Post Disaster Redevelopment Plan                      CME P11B Pub Works Dept, OEM, Dept of Plan, Dev, and Reg to identify damaged areas requiring rehab / redev; implement redevelopment plan, analyze and recommend haz mit options, recommend amendments                      CME P11C Damaged buildings to comply with South Florida Building Code; Dade County Code                      CME P11D Limit post-disaster redevelopment densities                      CME P10G Identify post-disaster relief staging areas, debris storage, disposal or burning                      CME P11F Repetitively damaged properties may be required to rebuild landward and to meet code</p>			

Abbreviations: G= Goal; O= Objective; P=Policy; PDRP= Post-Disaster Redevelopment Plan; HVZ= Hurricane vulnerability zone; CHHA= Coastal High Hazard Area

ASE= Aviation Sub-Element; CARDE= Conservation, Aquifer Recharge and Drainage Element; CIE= Capital Improvements Element; FLUE= Future Land Use Element; ICE= Intergovernmental Coordination Element; PMRSE= Port of Miami River Sub Element; PMMPSE= Port of Miami Master Plan Sub Element; WSSWE= Water, Sewer, and Solid Waste Element

## 6. Municipal Case Study: Miami Beach

As part of this study, a similar analysis to that of the County profile was completed for a statewide sample of 14 Florida municipalities, including Miami Beach in Miami-Dade County. The results of this analysis are provided in this section.

### Hazards Analysis

The following analysis looks at three hazard types that the City is vulnerable to: surge, flooding,, and wildfire. All of the information in this section was obtained online through MEMPHIS.

#### *Existing Population at Risk*

**Table 6.1** presents the population of Miami Beach at risk from hazards, as well as a breakdown of the sensitive needs populations at risk. Unfortunately, population statistics for the City’s flood zones were not available at the time of this report. Since Miami Beach is located on a barrier island, surge poses a significant threat to its residents. **Table 6.1** shows that 99.4% of the City’s population is at risk from surge. There are 36,981 disabled people within a surge zone as well. All of these people would likely be evacuated in the event of a hurricane, making evacuation routes and procedures a top priority for the City. Wildfire is not as major of a concern for the City since it mostly a barrier island and is very urban. Still though, **Table 6.1** shows that there are 4,321 people possibly at risk from a wildfire.

**Table 6.1 Estimated Number of Persons at Risk from Selected Hazards**

Population	Flood	Wildfire (medium-high risk)	Surge
Minority	NA	558	10,737
Over 65	NA	790	15,799
Disabled	NA	1,677	36,981
Poverty	NA	977	18,218
Language Isolated	NA	0	316
Single Parent	NA	319	5,412
<b>Citywide Total</b>	<b>NA</b>	<b>4,321</b>	<b>87,463</b>

Source: Florida Department of Community Affairs, 2005a.

#### *Existing Built Environment*

While the concern for human life is always of greatest importance in preparing for a natural disaster, there also are large 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 recover from a disaster. **Table 6.2** presents estimates of the number of buildings in Miami Beach, by structure type, that are at risk from two of the hazards being analyzed. Again, flood zone statistics were not available at the time of this analysis.

**Table 6.2** shows 51,304 structures at risk from surge, with 75.3% of those being multi-family structures. Hotels and condominiums are included in this category. There could be a large amount of property loss within the City in the case of a strong hurricane. Wildfire only poses a concern for 3,052 structures within the city limits.

**Table 6.2 Estimated Number of Structures at Risk from Selected Hazards**

Structure Type	Flood	Wildfire (medium-high risk)	Surge
Single-Family Homes	NA	498	4,566
Mobile Homes	NA	58	4
Multi-Family Homes	NA	2,028	38,647
Commercial	NA	459	7,702
Agriculture	NA	3	61
Gov./Institutional	NA	6	324
<b>Total</b>	NA	<b>3,052</b>	<b>51,304</b>

Source: Florida Department of Community Affairs, 2005a.

**Analysis of Current and Future Vulnerability**

Miami Beach’s vulnerabilities to surge, flood, and wildfire were analyzed spatially in relation to existing and future land uses within the City. Wildfire maps are not included for the City, however, since only 1 acre was considered to be within a medium to high risk wildfire zone. The following maps of existing land use within hazard areas are based on the 2004 GIS shapefiles from the Miami-Dade County Property Appraisers Office / Florida Department of Revenue. Maps of future land uses in hazard areas were developed using the Miami Beach Future Land Use Map obtained July 2004.

In **Attachment A**, two maps show the existing and future land uses within the coastal hazard zone (Category 1 storm surge) and the hurricane vulnerability zone (Category 1 evacuation zone) for Miami Beach. The entire city is within the hurricane vulnerability zone (HVZ) and the coastal hazard zone (CHZ). **Table 6.3** shows that 38.0% of city land is in residential use and 10.5% is still vacant. The maps in **Attachment A** show a significant amount of medium and high density future land use designations along the eastern most barrier island of the city suggesting development will be allowed in this area. **Table 6.4** shows that approximately 25% of the currently undeveloped acres are designated for high-density multi-family residential development, another 25% is designated for low-density multi-family residential development, approximately 13% is designated for medium-density multi-family developments, and about 12% is designated for future single-family homes. Any increase of population and property in the City of Miami Beach will increase the City’s vulnerability to surge and wind effects of hurricanes.

In **Attachment B**, two maps present the existing and future land uses within a 100-year flood zone. Again, all of the City of Miami Beach is within a flood zone. The same existing land use ratios as discussed above apply to the areas within a flood zone as well. Also, the future residential development discussed in the previous paragraph will also be within a flood zone.

**Table 6.3 Total Municipal Acres in Hazard Areas by Existing Land Use Category**

Existing Land Use Category		Coastal Hazard Zone	Hurricane Vulnerability Zone	Flood Zones	Wildfire Susceptible Areas
Attractions, Stadiums, Lodging	Acres	114.8	114.8	114.4	0.0
	%	2.5	2.6	2.4	0.0
Places of Worship	Acres	22.7	22.5	23.6	0.0
	%	0.5	0.5	0.5	0.0
Commercial	Acres	183.2	182.1	181.5	0.0
	%	4.0	4.1	3.9	0.0
Government, Institutional, Hospitals, Education	Acres	721.0	716.7	742.4	0.0
	%	15.9	16.0	15.9	0.0
Industrial	Acres	6.0	9.1	8.9	0.0
	%	0.1	0.2	0.2	0.0
Parks, Conservation Areas, Golf Courses	Acres	170.8	170.8	157.2	0.7
	%	3.8	3.8	3.4	63.6
Residential Group Quarters, Nursing Homes	Acres	4.9	4.7	4.9	0.0
	%	0.1	0.1	0.1	0.0
Residential Multi-Family	Acres	404.4	399.0	405.1	0.0
	%	8.9	8.9	8.7	0.0
Residential Mobile Home, or Commercial Parking Lot	Acres	53.7	52.6	55.3	0.0
	%	1.2	1.2	1.2	0.0
Residential Single-Family	Acres	1,261.1	1,247.5	1,313.7	0.2
	%	27.8	27.8	28.1	18.2
Transportation, Communication, Rights-of-Way	Acres	1,118.2	1,083.4	1,184.4	0.2
	%	24.6	24.2	25.3	18.2
Utility Plants and Lines, Solid Waste Disposal	Acres	6.2	7.6	8.0	0.0
	%	0.1	0.2	0.2	0.0
Vacant	Acres	475.5	472.2	481.1	0.0
	%	10.5	10.5	10.3	0.0
<b>Total Acres</b>	<b>Acres</b>	<b>4,542.5</b>	<b>4,483.0</b>	<b>4,680.5</b>	<b>1.1</b>
	<b>%</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Table 6.4 Total and Undeveloped Acres in Hazard Areas by Future Land Use Category for the City

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas	
		Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.
General Mixed Use Commercial "Performance Standard"	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
High Density Multi Family Residential	Acres	302.5	119.3	301.4	120.4	287.6	115.9	0.0	0.0
	%	6.7	25.1	6.7	25.5	6.1	24.1	0.0	0.0
High Density Residential "Performance Standard"	Acres	28.3	17.8	25.9	17.6	32.5	20.5	0.0	0.0
	%	0.6	3.7	0.6	3.7	0.7	4.3	0.0	0.0
High Intensity Commercial	Acres	125.3	5.3	124.8	5.3	126.6	5.3	0.0	0.0
	%	2.8	1.1	2.8	1.1	2.7	1.1	0.0	0.0
Intensive Mixed Use Commercial "Performance Standard"	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Light Industrial	Acres	21.6	0.7	26.1	0.7	27.4	0.7	0.0	0.0
	%	0.5	0.1	0.6	0.1	0.6	0.1	0.0	0.0
Limited Mixed Use Commercial "Performance Standard"	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Low Density Multi Family Residential	Acres	637.1	118.8	617.7	115.5	662.8	121.1	0.0	0.0
	%	14.0	25.0	13.8	24.5	14.2	25.2	0.0	0.0
Low Density Planned Residential	Acres	0.2	0.2	0.2	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
Low Intensity Commercial	Acres	28.3	2.9	28.3	2.9	28.8	2.9	0.0	0.0
	%	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0
Marine Recreation	Acres	2.2	2.2	2.2	2.2	2.7	2.7	0.0	0.0
	%	0.0	0.5	0.0	0.5	0.1	0.6	0.0	0.0
Medium Density Multi Family Residential	Acres	170.1	60.6	169.9	60.9	171.4	62.0	0.0	0.0
	%	3.7	12.7	3.8	12.9	3.7	12.9	0.0	0.0
Medium Density Planned Residential	Acres	7.8	0.0	7.8	0.0	9.8	0.0	0.0	0.0
	%	0.2	0.0	0.2	0.0	0.2	0.0	0.0	0.0
Medium Density Residential "Performance Standard"	Acres	17.2	8.7	17.2	8.7	17.2	8.7	0.0	0.0
	%	0.4	1.8	0.4	1.8	0.4	1.8	0.0	0.0
Medium Intensity Commercial	Acres	164.5	9.8	161.8	9.8	164.5	9.8	0.0	0.0
	%	3.6	2.1	3.6	2.1	3.5	2.0	0.0	0.0
Medium-High Density Residential "Performance Standard"	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medium-Low Density Residential "Performance Standard"	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed Use Entertainment	Acres	68.7	13.6	68.7	13.6	66.9	13.4	0.0	0.0
	%	1.5	2.9	1.5	2.9	1.4	2.8	0.0	0.0
Parking	Acres	34.6	2.9	34.6	2.9	35.4	2.9	0.0	0.0
	%	0.8	0.6	0.8	0.6	0.8	0.6	0.0	0.0
Phased Bayside Intensive Mixed Use Commercial "Performance Standard"	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 6.4 Total and Undeveloped Acres in Hazard Areas by Future Land Use Category for the City

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood Zones		Wildfire Susceptible Areas	
		Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.
Public Facility: Educational	Acres	62.4	0.0	62.4	0.0	62.4	0.0	0.0	0.0
	%	1.4	0.0	1.4	0.0	1.3	0.0	0.0	0.0
Public Facility: Governmental Uses and Convention	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Facility: Religious and Hospital	Acres	64.4	0.0	72.7	0.0	74.2	0.0	0.0	0.0
	%	1.4	0.0	1.6	0.0	1.6	0.0	0.0	0.0
Recreation and Open Space/Waterways	Acres	750.8	16.7	739.0	16.5	735.7	15.6	0.7	0.0
	%	16.5	3.5	16.5	3.5	15.7	3.2	63.6	0.0
Residential/Office	Acres	17.4	2.7	17.4	2.7	17.4	2.7	0.0	0.0
	%	0.4	0.6	0.4	0.6	0.4	0.6	0.0	0.0
Single Family Residential	Acres	1,783.4	52.2	1,749.6	51.3	1,896.2	54.4	0.4	0.0
	%	39.3	11.0	39.0	10.9	40.5	11.3	36.4	0.0
Special Public Facilities Educational	Acres	5.6	0.2	5.6	0.2	5.6	0.2	0.0	0.0
	%	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Townhome Residential	Acres	16.5	0.0	15.8	0.0	17.4	0.0	0.0	0.0
	%	0.4	0.0	0.4	0.0	0.4	0.0	0.0	0.0
<b>Total</b>	<b>Acres</b>	<b>4,542.6</b>	<b>475.5</b>	<b>4,483.1</b>	<b>472.2</b>	<b>4,680.4</b>	<b>481.1</b>	<b>1.1</b>	<b>0.0</b>
	<b>%</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>0.0</b>

**Comprehensive Plan**

Miami Beach’s Comprehensive Plan (amended in 2003) was reviewed in order to see what the City has already done to integrate the Miami-Dade County LMS policies, and hazard mitigation in general, into their planning process. A list of the goals, objectives, and policies currently in the plan that contributes to hazard mitigation is found in **Attachment G**. The following is a summary of how well the plan addressed the three hazards of this analysis.

The geographic location and physical characteristics of Miami Beach are part of what makes the city a regional asset. The same characteristics also create a challenge when addressing ways to mitigate hazards associated with natural disasters, particularly hurricanes and tropical storms. The City of Miami Beach is located on a barrier island directly east of the densely populated and developed metropolis of Miami. The City itself is very much developed but continues to offer prime public space on beaches and beachfront parks. There are comprehensive plan policies that address the unique characteristics of the city and promote hazard mitigation through a number of techniques including limiting residential densities, cooperation with State and Regional planning and emergency management entities and plans, the protection of coastal resources, the regulation of development, and the education of residents. Most of these policies aim to ensure adequate future evacuation capacity and safe evacuation procedures. (Miami Beach, 2003)

The City has a strong approach that directly addresses existing and future evacuation needs by employing policies that regulate density based on the Metropolitan Dade County Emergency Operations Plan and the Lower Southeast Florida Hurricane Evacuation Plan. Limiting future density can directly control the number of residents that would need to be evacuated and may help ensure adequate evacuation route capacity. Furthermore, Future Land Use Policy 4.1 aims to *reduce* densities to conform to a regional evacuation study revised by the U.S. Army Corps of Engineers and the National Hurricane Center.



There is a policy that regulates future development through design review procedures in the Land Development Regulations by requiring adequate evacuation capacity and emergency vehicle clearance. The City also has a policy that promotes the use of the Miami Beach Hurricane Handbook as a way to inform residents on the location of evacuation pick-up sites and a policy that promotes the establishment of shelters as a last resort to assist in hurricane evacuation. Other policies aim to address adequate evacuation buses, evacuation route improvements, and the evacuation of special needs populations.

A common hazard mitigation strategy for less developed areas is to protect coastal resources such as dunes and wetlands that may, in turn, absorb surge in the event of a hurricane or tropical storm. While the urban character of Miami Beach calls for mitigation policies that mainly address populations and the built environment, the City also maintains policies that protect beaches and dunes, and promote restoration efforts. The preservation of dunes and native vegetation can reduce beach erosion and flooding.

Finally, development in the city-wide Coastal High Hazard Area (CHHA) is subject to flooding from surge. The City maintains policies that require first floor elevations to be 8.8 feet above mean low tide to allow protection during flood conditions. Also, the City enforces setback and open space requirements as well as a floodplain ordinance to regulate new development during site plan review.

**Recommendations**

For the LMS to be effective in the decision-making process of growth management, its objectives and policies must be integrated into all jurisdictions' Comprehensive Plans. The Plan is the legal basis for all local land use decisions made. If hazard mitigation is to be accomplished beyond the occasional drainage project, these hazards must be addressed in comprehensive planning, where development can be limited or regulated in high-risk hazard areas just as sensitive environments are routinely protected through growth management policies. Mitigation of hazards is considerably easier and less expensive if done when raw land is being converted into development. Retrofitting structure and public facilities after they have been built is significantly more expensive. However, if older neighborhoods or communities are scheduled to be revitalized or redeveloped, hazard mitigation needs to be an aspect considered and integrated into the project prior to the time of development approval.

Miami Beach has begun the process of integrating hazard mitigation throughout its Plan's elements. The previous section summarized how the major hazards for the City have been for the most part well-addressed. There is, however, still an opportunity to incorporate more of the Miami-Dade LMS objectives into the policies in the Comprehensive Plan. By tightening the connection between these documents, the City will find it easier to implement hazard mitigation, and there will be higher awareness of these issues within the City. **Table 6.5** presents options for further integration as well as the basis for these recommendations.

NOTE: The recommendations set out in this section are only suggestions. Through the workshop process and contact with the local governments, the goal of this project is to result in specific recommendations tailored and acceptable to each jurisdiction. While the profile addresses hurricanes, flooding, and wildfire, during the update of the local Comprehensive Plan, the City should consider other hazards if appropriate, such as tornadoes or erosion.

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami Beach's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Basis For Suggested Options
<b>Strategy 1 - Collaboration, coordination, and education</b>			
<p><b>a) Is there information sharing &amp;/or involvement in plan development between planners &amp; emergency managers?</b></p>		<p>The City could adopt a Comprehensive Plan policy that promotes input from emergency managers and officials when making Comprehensive Plan amendments and land use changes in order to analyze any effects on hazard mitigation initiatives including evacuation route capacity, public facilities, public personnel, and infrastructure.</p>	<p>There were no polices found during this review that support the involvement of emergency managers when making such decisions. Involving emergency managers in matters that involve land development is a strong hazard mitigation strategy because it may allow insight into hazard mitigation issues prior to development and allow the City to take mitigative action.</p>
<p><b>b) Do the Comp Plan, LMS, CEMP, &amp; other local and regional plans cross-reference each other &amp; include consistent data on hazardous locations?</b></p>	<p>FLUE P 4.2 Permitted city population densities shall be reduced to better conform with the Metropolitan Dade County Offices of Emergency Management's 1991 Emergency Operations Plan and the experience with Hurricane Andrew. CCZME P 4.9 Population density maximums shall be reduced to coordinate with evac plans.</p>	<p>The City could add a Comprehensive Plan policy that supports the City's involvement and adherence with the Miami Dade Local Mitigation Strategy (LMS).</p>	<p>There were no policies found during this review that support involvement with the countywide LMS. The LMS includes an updated list and a narrative description of the hazard mitigation initiatives for the City of Miami Beach in Part II: The Projects, (page 126). Adding a Comprehensive Plan policy supporting the LMS can further bridge the City's hazard mitigation strategy to the regional strategy. Also, the City could explore the strengths of the LMS in order to strengthen its overall hazard mitigation strategy. The City could use the LMS goals and objectives to explore additional Comprehensive Plan polices aimed at protecting the health, safety, and welfare of the community.</p>
<p><b>c) Are hazard mitigation projects addressed in the 5-year schedule of Capital Improvement Projects?</b></p>		<p>The City could revise the criteria found in Capital Improvements Element Policy 1.5 to include projects that reduce the threats associated with natural disasters.</p>	<p>There were no polices found in the CIE during this review that direct address hazard mitigation initiatives. A policy could link the hazard mitigation initiatives found in the County LMS to the 5-year Schedule of Capital Improvements to further define a timetable and funding sources to achieve project completion.</p>

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami Beach's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Basis For Suggested Options
<p><b>d) Are there measures to educate residents, homeowner/property associations, &amp; the business community of ways they can mitigate against hazards?</b></p>	<p>CCZME P 4.2 The Miami Beach Hurricane Handbook will be distributed to the general public with detailed emergency operation instructions and hurricane evacuation pick-up sites</p>		
<p><b>Strategy 2 - Get out of the way: provide evacuation and sheltering services</b></p>			
<p><b>a) Are there measures to provide adequate evacuation clearance time to support current population and population growth?</b></p>	<p>FLUE O 4 Coordinate City population densities with emergency ops and evac plans through FLUM and zoning map amendments.                      FLUE P 4.1 Reduce population densities to conform with the Southeast Florida Hurricane Evacuation Study                      TE P 5.2 LDRs to control roadway access points in conjunction with development / require adequate capacity for emergency evacuation or emergency response vehicles.                      TE O 7 To improve hurricane evacuation the City shall coordinate with responsible agencies including the FDCA, MDEM, SFRPC and MD Transit Auth.                      TE P 7.3 Improve evacuation clearance times                      TE P 7.4 Evaluate entering into an agreement with a private contractor to assist with evacuation including during hurricane events.                      CCZME O 4 Reduce evacuation clearance times                      CCZME P 4.1 Future evac routes are to address flooding problems.                      CCZME P 4.4 Remove trees that may fall near in a hurricane away from evac routes.                      CCZME P 4.5 Provide evacuation busses.                      CCZME P 4.6 The City of Miami Beach Fire Department shall maintain and annually update the list of people who may need assistance due to physical or medical limitations in the event of an evacuation order to ensure their safe mobilization.                      CCZME P 4.7 The City of Miami Beach Fire Department shall review and update the Miami Beach Hurricane Evacuation Plan / maintain or enhance the resources and capabilities of the plan to provide effective implementation of evacuation procedures to ensure that evacuation times are maintained or reduced.</p>	<p>The City could create policies that adopt level of service (LOS) standards for evacuation route capacity demand, evacuation route clearance times, and evacuation shelter capacity.</p>	<p>The analysis in this report shows that evacuation clearance times and shelter capacity are a countywide challenge. LOS standards could be based on the regional evacuation plans and the State Shelter Plan. These LOS standards could act as a benchmark to measure adequate services for city residents. The effects of proposed future development could be analyzed to measure the affects on the level of service standards. The City could also explore a policy framework to maintain or improve the LOS standards through impact fees or other concessions. Further, Capital Improvements Element Policy 1.5 criteria three, prioritizes projects that prevent city services from falling below adopted LOS standards. Creating LOS standards for evacuation route capacity, evacuation route clearance times, and evacuation shelter capacity may help prioritize projects aimed at meeting deficiencies.</p>

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami Beach's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Basis For Suggested Options
<p><b>b) Are there measures to provide adequate shelter space to meet population growth and special needs?</b></p>	<p>TE P 7.1 Establish shelters of last resort within the City to assist with hurricane evacuation.</p>		
<p><b>Strategy 3 - Make the environment less hazardous: Protect and enhance natural protective features</b></p>			
<p><b>a) Are there measures to protect and/or restore natural resources that might in turn decrease the risk from natural hazards?</b></p>	<p>FLUE P 3.2 Within areas designated on the Future Land Use Map as conservation, no new development, or expansion or replacement of existing development shall be permitted except re-vegetation and construction of a beachfront promenade.            CCZME O 1 Protect beach and dune systems from adverse impacts of development.            CCZME P 1.2 Protect and restore beach vegetation.            CCZME P 2.22 Adopt an emergency water conservation plan            CCZME P 2.23 Protect natural areas and open space through public acquisition of land.            ROS P 4.5 Protect natural areas and quality of urban life by the public acquisition of land.            CIE P 6.5 The City will continue to expend funds as needed to maintain, repair, renew, replace or expand facilities that protect the dune system or other environmental assets.</p>	<p>The City can integrate the educational strategy found in Miami-Dade LMS Goal 5, found in Attachment E of this document, into the Comprehensive Plan.</p>	<p>Currently, the Comprehensive Plan contains one policy that promotes public education and dissemination of hazard related information dealing with emergency operation instructions and hurricane evacuation pick-up sites. This policy could be amended to include flood mitigation techniques, programs aimed to assist repetitive loss structures, the importance of protecting the natural environment, and firewise concepts. The City could further its commitment to providing hazard mitigation information to the public by amending this policy. Also, the City could also adopt a policy that promotes the training and education of city officials including site plan reviewers, land use planners, engineers, building inspectors, planners, and emergency managers in hazard mitigation techniques. This is a proactive way to address existing and future development in regard to known hazards. County officials can address future development and consider hazard mitigation issues before development occurs.</p>

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami Beach's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Basis For Suggested Options
<b>Strategy 4 - Make structures more resistant to natural hazard forces</b>			
<p><b>a) Are there measures that support relocating or retrofitting private &amp;/or public structures in hazard areas?</b></p>		<p>The City could adopt a policy that aims to relocate or retrofit substandard structures and public facilities in high hazard areas.</p>	<p>There were no policies that address mitigative actions for public and private structures, as well as repetitive loss structures, at risk from the effects of natural disasters. The hazard mitigation initiatives for the City listed in the LMS include a list of public structures in need of window protection. Adding a policy to the Comprehensive Plan could ensure these efforts are continued in the future. The City could also explore a policy that promotes acquisition or retrofit of repetitive loss structures in order to reduce property damages associated with natural disasters.</p>
<p><b>b) Are there measures to require compliance with or exceed building codes &amp;/or design standards for certain hazard areas?</b></p>	<p>FLUE P 8.1 Require that first floor elevations be constructed at 8.33 to 11.0 feet at mean low tide.            IE O 4 Enforce minimum floor level building elevations.            IE P 4.1 Continue site plan review for new construction with the requirement that the minimum first floor elevation for living quarters be at least 8.8 feet at MLW.            CCZME P 5.4 Beach development regulated by strict setback, open space and accessory use requirements found in LDRs and floodplain ordinance.</p>	<p>-</p>	
<p><b>c) Are there measures to protect cultural resources from natural disasters?</b></p>	<p>CCZME O 11 LDCs protect historic resources.            CIE P 1.2 Continue inspections of all capital facilities, coordinated by the Department of Design, Development and Historic Preservation Services, to monitor and record the condition of each.            HPE P 1.4 Address the rehabilitation of historic preservation sites or contributing structures.            HPE P 2.2 Provide funding to subsidize the rehabilitation of existing hotels and the construction of a new hotel or hotels in the City Center/Historic Convention Village Area which are designed to be sensitive to the historic character of the area.            HPE P 2.3 Adopt a master plan for the redevelopment of Lincoln Road as a historic cultural and retail center.</p>		

**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami Beach's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Basis For Suggested Options
<b>Strategy 5 - Manage the development and redevelopment of land in hazardous areas</b>			
<p><b>a) Are there measures to limit population densities in high-hazard areas?</b></p>	<p>CCZME O 9 Population concentrations away from city-wide coastal high hazard area by prohibiting residential density increases.</p>	-	
<p><b>b) Are there measures to limit public expenditures that subsidize development in high-hazard areas?</b></p>	<p>CCZME GOAL: Provide public improvements and restrict development activities that would damage or destroy coastal resources, protect human life and limit public expenditures in hazard areas subject.            CCZME P 5.1 Limit funding of public infrastructure capacity expansion.            CCZME O 8 Infrastructure Capacity Expansion. Limit public infrastructure expenditures that subsidize development in the CHHA            CCZME P 8.1 Limit funding any public infrastructure capacity expansion.            CIE O 6 Limit public infrastructure expenditures that subsidize development in the CHHA except for restoration and enhancement of natural resources.            CIE P 6.1 Limit funding any public infrastructure capacity expansion.</p>		
<p><b>c) Are there creative neighborhood design solutions or development regulations that mitigate hazards, such as clustering or transfer of development rights?</b></p>		-	



**Table 5.1 Options for Integrating LMS Hazard Mitigation Principles into Miami Beach's Comprehensive Plan (DRAFT)**

Strategies & Integration Topics	Current Comprehensive Plan Policies	Options for Further Integration into the Comprehensive Plan	Basis For Suggested Options
<p><b>d) Are there measures to limit redevelopment in hazard areas and procedures for post-disaster recovery that will lead to a more disaster-resistant community?</b></p>	<p>CCZME P 5.5 By 1998, the City shall adopt a post-disaster redevelopment plan No redevelopment shall be permitted in areas of repeated damage.</p> <p>CCZME P 5.6 The adopted plan shall specify that during post-disaster redevelopment, the Building Department will distinguish between those actions needed to protect public health and safety with immediate repair/cleanup and long term repair activities and redevelopment areas. Removal or relocation of damaged infrastructure and unsafe structures shall be by the Miami Beach Public Services Department.</p> <p>CCZME P 5.7 Use the post-disaster redevelopment plan to reduce or eliminate the future exposure of life and property to hurricanes; incorporate recommendations of interagency hazard mitigation reports; analyze and recommend to the City Commission hazard mitigation options for damaged public facilities; and recommend amendments, if required, to the City's Comprehensive Plan.</p> <p>CCZME P 5.8 Eliminate unsafe conditions and inappropriate uses identified in the post-disaster recovery phase.</p>		
<p>Abbreviations: G= Goal; O= Objective; P=Policy; PDRP= Post-Disaster Redevelopment Plan; HVZ= Hurricane vulnerability zone; CHHA= Coastal High Hazard Area</p>			
<p>CE= Conservation Element; FLUE= Future Land Use Element; IE= Infrastructure Element; CIE= Capital Improvements Element; TE= Transportation Element; CCZME=Conservation / Coastal Zone Management Element; HPE=Historical Preservation Element; ROS= Recreation and Open Space Element</p>			

## 7. Sources

- Miami-Dade County. 2001. *Miami-Dade County Comprehensive Development Master Plan*.
- Miami-Dade County. 2005. *Local Mitigation Strategy*.
- Miami Dade County. 2003. *Comprehensive Emergency Management Plan*.
- City of Miami Beach. 2003. *City of Miami Beach Comprehensive Plan*.
- Florida Department of Community Affairs. 2004. *Statewide Emergency Shelter Plan*. Tallahassee, FL.
- Florida Department of Community Affairs. 2005a. *Mapping for Emergency Management, Parallel Hazard Information System*. Tallahassee, FL.  
<http://lmsmaps.methaz.org/lmsmaps/index.html>.
- Florida Department of Community Affairs. 2005b. *Protecting Florida's Communities: Land Use Planning Strategies and Best Development Practices for Minimizing Vulnerability to Flooding and Coastal Storms*. Tallahassee, FL.
- State of Florida. 2005. Hurricane Evacuation Study Database. Florida Department of Community Affairs, Division of Emergency Management.
- University of Florida, Bureau of Economic and Business Research. 2004. *Florida Statistical Abstract*. Gainesville, FL.
- U.S. Census Bureau. 2000. *State & County Quickfacts*. Retrieved in 2005 from <http://quickfacts.census.gov/qfd/index.html>.

**Attachment A**

**Maps of the Existing and Future Land Uses within the  
Coastal Hazard Zone and the Hurricane Vulnerability Zone**

**Attachment B**

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

**Attachment C**

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

**Attachment D**

**Maps of the Existing and Future Land Uses  
within Potential Sinkhole Hazard Areas**



## Attachment E

### **Miami-Dade County Local Mitigation Strategy Goals and Objectives**

#### **Goals**

1. The primary mitigation goal is to reduce vulnerability to natural, technological and societal hazards from all sources but especially, in South Florida, from hurricanes, tornadoes, major rainfall and other severe weather events.
2. Related to the above is the goal to mitigate the extent and severity of the problems created by these hazards and to, collaterally, secure the necessary commitments and, to the maximum extent feasible, the necessary resources to implement mitigation activities in annual action plans to achieve these goals.
3. To prevent any additions to the list of "Repetitive Loss Properties" published annually by FEMA and to reduce the number of repetitive loss properties to a point where the municipalities and the county can qualify as a category A or B Community (i.e. a community containing no more than nine repetitive loss properties). A repetitive loss property is a single property that has two or more NFIP flood insurance claims of \$1,000 or more.
4. To assure incremental improvements in municipalities' standing and classification in the Community Rating System (CRS), with the related consequences of making flood insurance under the NFIP more affordable and reachable, while improving cities' effectiveness in coping with flood hazards, problems and emergencies. It is also a goal of the Local Mitigation Strategy to ensure that all the municipalities in Miami-Dade County are or will become members of the CRS program.
5. Increase the continual dissemination of information on a repetitive basis with respect to the existence of flood hazards and the availability of measures to mitigate the problems presented by such hazards.
6. Continually improve and maintain cutting-edge, state-of-the-art, effectiveness of the cities' emergency preparedness and disaster response capacity.
7. To increase the level of coordination of mitigation management concerns, plans and activities at the municipal, county, state and federal levels of government.
8. To secure an enforceable commitment for the implementation of the local hazard mitigation strategy.

#### **Objectives**

1. To follow the mitigation recommendations espoused in the FEMA publication *Building Performance: Hurricane Andrew in Florida*, a document that dramatically sets forth the many deficiencies brought to light by Hurricane Andrew.
2. Protection of expressways, major highways and other thoroughfares and, more importantly, our bridges and causeways to provide for continuous, free flowing traffic and circulation as needed for the effective and unencumbered provision of emergency services and evacuation operations.

3. Protection of “critical facilities” vital to the safe and continuous operation of countywide infrastructure including hospitals and health facilities; water and sewer facilities; major airports; the seaport; electrical, natural gas and telephone systems; bus and rail lines; schools and waterways.
4. Protection of critical facilities vital to disaster response, including the structures occupied by the fire and Police Departments and all other emergency-related personnel, equipment and facilities involved with the transportation, communication, and energy requirements for an effective response to a major rainstorm, hurricane, tornado, terrorist act or other similar disaster event.
5. Addition of building envelope protection – including window and door protection – and inclusion of a continuous load path from roof to foundation on all structures within the county.
6. Reduction or mitigation of low points in the county’s or cities’ topography; specifically to encourage the flow of storm water away from structures and toward streets where storm drainage systems are concentrated and to eliminate or modify surfaces that would otherwise drain toward these low points.
7. Reduction and mitigation of rainstorm hazards and problems.
8. Reduction and mitigation of storm surge hazards and effects by encouraging greater setbacks from shorelines for new developments of waterfront properties, encouraging retrofitting and elevation of structures with high priority consideration for those built on waterfront properties, seeking opportunities to acquire, exchange or otherwise secure limited control of waterfront real estate.
9. Goals related to existing soil conditions.
10. Reduction and mitigation of problems from structures built below base flood elevation (BFE). These “old law” buildings were constructed under the older Dade County Building Code, which only required the finished floor elevation of a structure to be 13” above the crown of the road. The goal is to reduce the number of and eventually eliminate structures built with a finished floor elevation below the BFE.
11. Collection of flood data information and analysis and completion of a countywide database which incorporates a wider range of property data, topographical data, storm drainage data, rainfalls data, building permit data, data on insurance, history of flooding, etc.
- (12) 9\*. Enhancement of the land component of real estate values throughout the county, thereby creating a market driven, rather than regulatory environment for the “substantial improvement” (i.e. more than 50% of value) of structures with current finished floor elevations below BFE.
- (13) 10\*. Enhance public information and involvement and increase the public awareness of hazards and problems and educate the public through a widespread program of general information, media coverage and participatory involvement.
- (14) 11\*. Initiate organizational, managerial and administrative goals to make mitigation a mainstream function of government affairs; spread the responsibilities throughout many departments and agencies to ensure continuity and a full integration of mitigation management functions in the operations of government.

\*NOTE: The Miami Dade LMS objectives contained two objectives numbered 9, 10, and 11. For clarity purposes in this analysis, they are numbered 12, 13, and 14 respectively.

## Attachment F

### Miami-Dade County Comprehensive Plan Excerpts Related to Hazard Mitigation

#### FUTURE LAND USE ELEMENT

##### **Objective 3**

Upon the adoption of the CDMP, the location, design and management practices of development and redevelopment in Miami-Dade County shall ensure the protection of natural resources and systems by recognizing, and sensitively responding to constraints posed by soil conditions, topography, water table level, vegetation type, wildlife habitat, and hurricane and other flood hazards, and by reflecting the management policies contained in resource planning and management plans prepared pursuant to Chapter 380, Florida Statutes, and approved by the Governor and Cabinet.

##### **Policies**

3A. Development orders in Miami-Dade County shall be consistent with the goals, objectives and policies contained in the Conservation and Coastal Management Elements of this Plan, and with all applicable environmental regulations, as well as all other elements of the CDMP.

3B. All significant natural resources and systems shall be protected from incompatible land use including Biscayne Bay, future coastal and inland wetlands, future potable water-supply wellfield areas identified in the Land Use Element or in adopted wellfield protection plans, and forested portions of Environmentally Sensitive Natural Forest Communities as identified in the Natural Forest Inventory, as may be amended from time to time.

3C. Development in the Big Cypress Area of Critical State Concern, and in the East Everglades as defined in Section 33B-13, Code of Miami-Dade County, Florida (1981) shall be limited to uses, designs and management practices which are consistent with adopted State regulations and policies and related federal, State or County policies, plans or regulations as may be formulated, consistent with the goals, objectives and policies of this comprehensive plan. Miami-Dade County shall improve its enforcement of East Everglades development regulations and shall improve such regulations if necessary to enable effective enforcement.

3D. Miami-Dade County shall not sponsor any growth-subsidizing programs which promote future population growth and residential development on the barrier islands of Miami-Dade County. The provision of facilities and services to accomplish the timely evacuation of already-developed barrier islands in advance of approaching hurricanes shall be a priority of Miami-Dade County's transportation planning and hurricane preparedness programs.

3E. By January 1, 2002, Miami-Dade County shall develop and initiate implementation of an integrated land use and water management plan for southeastern Miami-Dade County, based on a Comprehensive Study (the "Study") as described below. The January 1, 2002 date may be extended as necessary by a subsequent CDMP amendment filed by the County. The Plan will direct the comprehensive management of land uses and surface and ground water, its quality, quantity, timing, and distribution. The plan will have two time horizons: 1) a short-term component extending through the year 2015, and 2) a long-term component extending through the year 2050. The overall goal of the plan will be to optimize the economic, social, and environmental values currently recognized in the County's Comprehensive Development Master Plan in the study area from the C-2 canal basin south to US-i as a primary emphasis, and the C-3 canal basin as a secondary area. (See following map).

8A. Miami-Dade County shall strive to accommodate residential development in suitable locations and densities which reflect such factors as recent trends in location and design of residential units; projected availability of service and infrastructure capacity; proximity and accessibility to employment, commercial and cultural centers; character of existing adjacent or surrounding neighborhoods; avoidance of natural resource degradation; maintenance of quality of life and creation of amenities. Density patterns should reflect the Guidelines for Urban Form contained in this Element.

9N. By 1997, Miami-Dade County shall endeavor to initiate review and revision of its Zoning Code and Subdivision Regulations to facilitate the development of better planned communities and better designed buildings. Changes to be considered shall include provisions for: the development with its surroundings. Moreover, notwithstanding adoption of these intensity ceilings in the CDMP, estimations of prospective urban service demands or impacts of proposed developments will be based on the actual approved uses and/or intensity of a particular development when applicable, and for purposes of long-range areawide service facility planning purposes, such estimations may be based on averages or trends of development types and intensities in localized areas when consistent with sound service/facility planning practice. The following allowable maximum intensities are expressed as the floor area ratio (FAR) of building square footage (not counting parking structures) divided by the net lot area of the development parcel.

## **TRANSPORTATION ELEMENT**

### **Objective 6**

Plan and develop a transportation system that preserves environmentally sensitive areas, conserves energy and natural resources and promotes community aesthetic values.

### **Policies**

6A. The County shall avoid transportation improvements which encourage or subsidize increased development in coastal high hazard areas or environmentally sensitive areas identified in the Coastal Management and Conservation Elements.

6B. Land access interchanges shall not be placed or constructed in a manner that would provide access to environmental protection areas or other areas to be conserved in order to prevent undue pressure for development of such areas.

4D. Dade County shall set as a priority in its transportation planning program the provision of facilities and services to accomplish the timely evacuation of Dade County's barrier islands in advance of approaching hurricanes.

6D. New roadways shall be designed to: prevent and control soil erosion, minimize clearing, and grubbing operations, minimize storm runoff, and avoid unnecessary changes in drainage patterns.

## **AVIATION SUB-ELEMENT**

### **Objective 6**

Maximize compatibility of aviation facilities and operations with the natural environment.

### **Policies**

6A. The Dade County Aviation Department shall expand existing, and locate and develop future, aviation facilities so as to produce no significant adverse impact on the South Florida Water Management District Conservation Areas, Everglades National Park, Biscayne National Park, other environmental protection areas and wetfield protection areas in accordance with the policies of the Land Use, Conservation, Aquifer Recharge and Drainage, and Coastal

Management Elements of the Dade County Comprehensive Development Master Plan, and pertinent regulations governing facility siting and development.

### **PORT OF MIAMI RIVER SUB-ELEMENT**

#### **Objective 3**

The Port of Miami River shall be operated in a manner which minimizes impacts to estuarine water quality and marine resources and adjacent land uses.

#### **Policies**

3B Dade County shall stabilize all eroding County-owned shoreline areas and rights-of-way along the Miami River consistent with available funding, and the County shall develop an ordinance requiring shoreline stabilization where necessary on public and private sites along the river.

### **THE PORT OF MIAMI MASTER PLAN SUB-ELEMENT**

#### **Goal B**

in carrying out its day-to-day operations and its long-term expansion program, the port of miami shall minimize any detrimental effects on the environment, the community, and supporting infrastructure and shall continue to coordinate its operation and expansion activities with federal, state, and regional, agencies other miami-dade county departments, neighboring municipalities, and surrounding communities as appropriate. pmpmse o4 port shall promote strong environmental practices.

#### **Objective 4**

The port shall promote sound environmental practices in its day-to-day operations and long-term maintenance and expansion plans, consistent with the unique role and responsibilities of deep-water port facilities.

#### **Policies**

4A. The port shall periodically review its environmental practices in response to new information and community issues.

4C. By 2001, the port shall explore the feasibility of mitigation banking as a long-range option for natural resource planning. The feasibility study should address the beneficial use of suitable dredged materials, the value of integrated ecosystems including submerged habitats, shoreline habitats, and upland areas for mitigation, and ways to integrate public access, as well as recreational and educational opportunities into mitigation areas.

### **HOUSING ELEMENT**

7B Continue to utilize appropriate development review procedures to protect new residential developments in the County from potentially adverse environmental impact and provide and implement programs that reduce or eliminate adverse environmental impact on existing residential developments in the County.

10C. Assure the availability of suitable emergency shelters, transitional housing, and relocation programs for very low, low and moderate income populations who have lost their housing, especially when displacement occurs due to redevelopment or natural disaster.

### **CONSERVATION, AQUIFER RECHARGE, AND DRAINAGE ELEMENT**

#### **GOAL 1**

Provide for the conservation, environmentally sound use, and protection of all aquatic and upland ecosystems and natural resources, and protect the functions of aquifer recharge areas and natural drainage features in Dade County.

**Policies**

4A. The aquifer-recharge values of wetland areas shall be maintained and, where feasible, enhanced or restored. There shall be no further positive drainage of wetlands to accommodate urban development or agricultural uses.

**Objective 5**

Dade County shall continue to develop and implement stormwater master plans, and cut and fill criteria as necessary to provide adequate flood protection; correct system deficiencies in County maintained drainage facilities; coordinate the extension of facilities to meet future demands throughout the unincorporated area; and maintain and improve water quality. Plans for all basins in the County shall continue to be prepared sequentially with the last plans being completed by 2007, and sooner if additional funding is obtained, and implementing actions recommended in each basin plan shall commence immediately after the applicable plan is approved. Outside of the Urban Development Boundary the County shall not provide, or approve, additional drainage facilities that would impair flood protection to easterly developed areas of the County, exacerbate urban sprawl or reduce water storage.

**Policies**

5A. The Stormwater Management (Drainage) Level of Service (LOS) Standards for Dade County contains both a Flood Protection (FP) and Water Quality (WQ) component. The minimum acceptable Flood Protection Level of Service (FPLOS) standards for Dade County shall be protection from the degree of flooding that would result for a duration of one day from a ten-year storm, with exceptions in previously developed canal basins as provided below, where additional development to this base standard would pose a risk to existing development. All structures shall be constructed at, or above, the minimum floor elevation specified in the federal Flood Insurance Rate Maps for Dade County, or as specified in chapter 11-C of the Dade County Code, whichever is higher.

5E. Dade County shall establish a priority listing of stormwater drainage and aquifer recharge improvements needed to correct existing system deficiencies and problems, and to provide for future drinking water needs. This shall include:

- Drainage/stormwater sewer system improvements in developed urban areas with persistent drainage problems;
- Canal and/or stormwater drainage improvements in developed urban areas that have less than one in ten year storm protection and where no roadway drainage improvements are planned or proposed, which would remedy the problems,
- Hydrologic modifications that are needed to deliver water to public waterwells or to protect those waterwells from prospective contamination.
- This shall be based on such factors as:
- Miles of canals with out-of-bank flow;
- Miles of collector and local streets impassable during a 5 year storm;
- Miles of minor arterial streets impassable during a 10 year storm;
- Miles of principal arterials, including major evacuation routes, that are impassable during a 100 year storm; and
- Number or structures flooded by a 100 year storm.

**Objective 6**

Soils and mineral resources in Dade County shall be conserved and appropriately utilized in keeping with their intrinsic values.

**Objective 7**



Dade County shall protect and preserve the biological and hydrological functions of the Future Wetlands identified in the Land Use Element. Future impacts to the biological functions of publicly and privately owned wetlands shall be mitigated. All privately owned wetlands identified by the South Florida Regional Planning Council as Natural Resources of Regional Significance and wetlands on Federal, State, or County land acquisition lists shall be supported as a high priority for public acquisition. Publicly acquired wetlands shall be restored and managed for their natural resource, habitat and hydrologic values.

**Policies**

7A. The degradation or destruction of wetlands shall be limited to activities that 1) are necessary to prevent or eliminate a threat to public health, safety or welfare, or 2) are water dependent, clearly in the public interest and no other reasonable alternative exists or; 3) are carried out in accordance with an approved basin management plan or; 4) are in areas that have been highly disturbed or degraded and where restoration of a wetland with an equal or greater value in accordance with federal, State and local regulations is feasible. Habitats critical to endangered or threatened species shall not be destroyed.

7B. Offroad vehicles shall not be allowed in the future publicly owned and managed wetlands identified in the adopted Land Use Element unless there are permitted facilities or areas specified for their use.

7C. Dade County shall continue to promote the restoration and maintenance of the natural, surface water flow regimes into, and through wetland systems such as the Shark River Slough, Everglades National Park and the saline wetlands of southeastern Dade County.

7D. Management plans shall be developed to govern all development activity within all natural communities on County-owned lands to protect natural and historic resources. The Department of Environmental Resources Management (DERM) and the Historic Preservation Division shall assist the appropriate County agencies in the development of these plans, which shall be subject to public review and comment as they are prepared and implemented.

7E. All wetlands on the State Save Our Rivers or Dade County Environmentally Endangered Lands acquisition lists shall be given very high priority for public acquisition as are all lands within the Environmental Protection category on the Land Use Plan (LUP) map.

7G. Dade County shall continue to work with the appropriate federal, State, regional and local agencies to develop wetland basin management plans for all the planned future wetlands areas in Dade County. These plans shall identify biological and wildlife habitat values, recharge and runoff detention values, and key management issues, including fill encroachment criteria. They shall also describe a coordinated approach to be followed by all levels of government in their respective permitting functions in order to retain the long term, net wetland values of these areas. Priority for plan development shall be given to the wetlands in South Dade County that are slated for purchase under the Save Our Rivers and Dade County Environmentally Endangered Lands programs.

8F. Dade County shall continue to seek natural areas land management funds to conduct pineland controlled burns, reforestation, and exotic pest plant control. The County shall also seek funds to control and remove exotic pest plant species from public rights-of-way and other County-owned land outside of parks and natural areas.

**WATER, SEWER, AND SOLID WASTE ELEMENT**

**GOAL**

Provide for potable water, and sanitary sewer facilities which meet the county's needs in a manner that promotes the public health, environmental protection, operational efficiency, cdmp-planned land use, and economic opportunity.



**Objective 5**

Develop and implement a comprehensive water conservation program to ensure that a sufficient, economical supply of fresh water is available to meet current and future demand for potable water without degrading the environment.

**Policies**

5D. Promote an educational program for residential, commercial and industrial consumers which will discourage waste and conserve water.

**RECREATION AND OPEN SPACE ELEMENT**

**GOAL**

Develop, program, and maintain a comprehensive system of parks and recreational open spaces offering quality and diversity in recreational experiences while preserving and protecting valuable natural, historical and cultural resources, unimpaired, for present and future generations.

**Policies**

3C. Through its park and recreation programs and all other available means, Dade County shall preserve and protect beaches and shores and maximize public ownership of these coastal resources. The County shall improve the maintenance of existing public park and recreation entrances and shall, where feasible, provide additional access points at waterfront and coastal locations.

**Objective 5**

Maintain a formal capital improvements planning program that improves and expands the park and recreation system through the acquisition of land, the renovation and restoration of facilities and natural areas, and the development of new park and recreation open space and facilities.

**Policies**

5A. The County shall prioritize capital improvement expenditures in accordance with the following criteria: 1) Acquire local parkland to maintain the adopted LOS standard for local recreation open space by correcting existing deficiencies and addressing future needs, and acquire areawide parkland suitable for compatible outdoor recreation while preserving natural, historical, and cultural resources; 2) renovate, restore, and upgrade existing recreation open spaces and facilities, and; 3) develop new recreation open spaces and facilities within undeveloped or incomplete parks.

5C. The Park and Recreation Department shall, as funds are available, renovate, restore, and upgrade County facilities to ensure that the public can safely and securely enjoy recreational opportunities, and that the County can cost-effectively extend the useful life of existing facilities. Expenditures for the renovation, restoration and upgrade of existing parks and recreation facilities are prioritized as follows: 1) repairs and projects increasing visitor safety; 2) hazard reduction; 3) facility upgrade and resource management; 4) accessibility improvements in compliance with ADA, and; 5) energy efficiency improvements. The County shall implement projects and activities including but not limited to the following in order to address these priorities.

- i.) The Park and Recreation Department will repair facilities, equipment, and grounds that have the potential to be unsafe for public use, and install adequate security measures to protect visitors and facilities.
- ii.) The Park and Recreation Department will remove known hazards existing within its facilities. Provisions will be made to remove or abate asbestos within buildings, remove or mitigate materials containing lead, and provide storm protection to walls, windows and doors.
- iii.) The Park and Recreation Department will redevelop facilities that are no longer functional, whose use has changed, or that require building code upgrades. Park sites

- containing important natural, historic, or archaeological resources will be developed and managed for the long-term sustainability and integrity of the resource.
- iv.) The Metro-Dade Park and Recreation Department shall continue to provide improved access for persons with disabilities by removing architectural, communication and program barriers to participation in compliance with ADA.
  - v.) The Park and Recreation Department will install energy efficient equipment within its facilities that measurably: 1) decreases water consumption and treatment within restrooms and irrigation systems; 2) increases the use of more energy efficient cooling, refrigeration, and lighting equipment, including solar powered lighting; 3) increases the use of fuel-efficient park maintenance vehicles, and; 4) increases the use of automated equipment to filter and monitor swimming pools.

**Objective 6**

Maintain and continue to implement the comprehensive resource management program for the acquisition and site-specific management of environmentally sensitive lands, coastal areas and historic sites within Dade County parks.

**Policies**

6B. Those portions of park properties containing important natural, historic, or archaeological resources will be developed and managed for long-term viability and integrity of the resource. Through its park and recreation programs the County shall, wherever feasible, acquire and reuse historic buildings and sites to benefit the public. Opportunities for public access to the resource will be developed in a manner which is consistent with the conservation or preservation of the resource.

**COASTAL MANAGEMENT ELEMENT**

**GOAL**

Provide for tile conservation, environmentally sound use and protection of all natural and historic resources; limit public expenditures in areas subject to destruction by natural disasters; and protect human life and property in tile coastal area of metropolitan Dade County, Florida.

**Objective 1**

Protect, conserve, and enhance coastal wetlands and living marine resources in Dade County.

**Policies**

- 1A. Tidally connected mangroves in the following shall be designated as "Mangrove Protection Areas":
- Oleta River State Recreation Area;
  - Haulover Park;
  - Bird Key (privately owned);
  - Near-shore islands and northwestern shoreline of Virginia Key;
  - The western shore of Key Biscayne;
  - Bear Cut Preserve;
  - The Cocoplum Mangrove Preserve;
  - Matheson Hammock Park;
  - R. Hardy Matheson Preserve;
  - Chapman Field Park;
  - The Deering Estate and Chicken Key;
  - Paradise Point south shoreline (privately owned);
  - Coastal mangrove and scrub forests within and adjacent to Biscayne National Park and Everglades National Park; and
  - Coastal Mangrove and scrub forest adjacent to Card Sound.

In these areas no cutting, trimming, pruning or other alteration of mangroves shall be permitted except for purposes of surveying or for projects that are: (1) necessary to prevent or eliminate a threat to public health, safety or welfare; (2) water dependent; or (3) clearly in the public interest and where no reasonable upland alternative exists. In such cases, the trimming or alteration shall be kept to the minimum, and done in a manner which preserves the functions of the mangrove system, and does not reduce or adversely affect habitat used by endangered or threatened species.

1B. Natural surface water flow regimes into and through coastal wetland systems will be restored and maintained to the maximum extent possible.

1C. Where shoreline access is to be provided through Mangrove Protection Areas or tidally connected coastal marshes, elevated boardwalks, designed to minimize the impact to wetland vegetation, shall be utilized.

1D. Mangrove forest, coastal hammock or other natural vegetative communities which remain in urban areas shall be maintained, protected, and incorporated into landscaping plans where development or redevelopment is to occur. To promote revegetation of coastal band mangrove trees, pruning or alteration of propagule or seed bearing trees shall be conducted in such a manner to preserve as much of the seed source as possible. Limited removal and trimming of mangrove trees for the purpose of providing necessary maintenance and/or visual shoreline access may be permitted, pursuant to the provisions of Chapter 24.58 of the Code of Metropolitan Dade County, as may be amended from time to time, if monitored and done under expert supervision and mitigation is performed if required by Dade County DERM.

1E. Wherever a coastal wetland is degraded or destroyed, a wetland with an equal or greater amount of habitat value shall be created or restored, maintained and monitored for three years or until such time as a viable self-perpetuating wetland habitat is established. Created habitats shall be perpetually maintained free of invasive exotic vegetation. Habitats of endangered or threatened species shall not be degraded or destroyed.

1F. Replanting of mangroves and marsh grasses shall be used to enhance spoil islands, street ends, rights-of-way, parks, and other public or semi-public shorelines. Mangroves and marsh grasses should be planted in riprap planters except in extremely protected areas with very limited public access. DERM shall maintain guidelines for the construction of planters and the selection and placement of vegetative material.

## **Objective 2**

Protect, conserve or enhance beaches and dunes and offshore reef communities.

## **Policies**

2A. Where beach restoration or renourishment is necessary, the project shall be designed and managed to minimize damage to the offshore grass flats and dune vegetation.

2B. Beaches shall be stabilized by planting, maintaining and monitoring appropriate dune vegetation, and by providing elevated footpaths or other means of traversing the dune without contributing to erosion. All subsequent activities or development actions on, or bordering the restored beach, shall be compatible with and contribute to beach maintenance.

5C. Dade County shall continue to place a high priority on the acquisition of coastal lands for use as parks and preserves.

5F. The siting of water dependent facilities shall be based on upland, shoreline and in-water characteristics, as well as submerged land ownership. At a minimum, the following general criteria shall be used to determine the appropriateness of sites within the Coastal Area for manna/water-dependent projects:

- i) Construction or subsequent operation of any proposed marina! water-dependent project shall not destroy or degrade:
  - (a) Hammocks, pinelands, or salt marshes, or
  - (b) Mangrove Protection Areas, or
  - (c) Seagrass or hard bottom communities, or
  - (d) Habitats used by endangered or threatened species.
- ii) Where applicable, the proposed marina/water-dependent project site shall have:
  - (a) A minimum depth of 4 feet at mean low tide in the proposed marina basin and access channel, and direct access to the Intracoastal Waterway or to another dredged channel or area with a minimum of 6 feet at mean low tide, and
  - (b) Good landside accessibility.
- iii) The proposed marina/water-dependent facility shall be:
  - (a) Compatible with existing, surrounding land uses;
  - (b) Of sufficient size to accommodate project and the required parking; and
  - (c) Consistent with the requirements of Dade Count/s Shoreline Development Review process, as specified in Chapter 33D of the Code of Metropolitan Dade County, as may be amended from time to time.
- iv) The proposed marina/water-dependent facility shall:
  - (a) Preserve or improve traditional public shoreline uses and public access to estuarine and coastal waters, and
  - (b) Preserve or enhance the quality of the estuarine and coastal waters, water circulation, tidal flushing and light penetration, and
  - (c) Preserve archaeological artifacts or zones and preserves or sensitively incorporate historic sites, and
  - (d) Where applicable, provide a hurricane contingency plan.

**Objective 6**

Dade County shall preserve traditional shoreline uses and minimize user conflicts and impacts of man-made structures and activities on coastal resources.

**Policies**

7B. Dade County Parks Department shall continue to offer interpretive programs and special events to promote understanding and appreciation of the County’s coastal resources by residents and visitors.

7D. Dade County shall continue its public involvement in natural areas restoration including removing invasive exotic plant species, reseeding or replanting native vegetation, enhancing habitat, monitoring wildlife, and renourishing dunes in coastal County parks.

**Objective 8**

The existing time period required to complete the evacuation of people from flood vulnerable Coastal Areas and mobile homes prior to the arrival of sustained tropical storm force winds shall be maintained or lowered by 2000. Shelter capacity within Dade County shall be increased by 25 percent by 2000.

**Policies**

8A. Dade County shall annually review and update the hurricane evacuation procedure section of its Emergency Operations Plan (E.O.P.) and maintain or enhance, as necessary, the resources and capabilities of the Dade Office of Emergency Management to provide effective implementation of the E.O.P.

8B. Dade County shall request that State government better assist Dade County with funding emergency planning and operations, including future State funding for the preparation of hazard mitigation and post-disaster redevelopment plans. To reflect the larger scale and complexity of planning, preparation, response, and recovery within large counties, Dade County shall request the State to revise its current funding distribution formula for natural disaster planning and

emergency operations from the present equal distribution of monies between the 67 Florida Counties to a proportionate distribution formula reflecting population.

8C. Dade County shall develop a public education program prior to the hurricane season to notify households and operators of hotels, motels or time-share condominiums in flood vulnerable Coastal Areas of their need to evacuate and seek safe shelter in the event of a hurricane. The public education program should also be utilized to disseminate emergency preparedness information. Emergency information shall be printed in the community interest section of the telephone book.

8D. Dade County shall encourage its residents to be better prepared and more self-reliant in the event of a hurricane, including planning ahead for early evacuation and sheltering with family or friends living outside evacuation areas.

8E. Dade County shall establish and maintain mutual aid agreements and contracts that would facilitate and expedite post-disaster emergency response and recovery.

8F. If any update of the hurricane evacuation study shows an increase or projected expansion in the time required to safely clear the roadways in and from areas subject to coastal flooding, measures shall be undertaken to maintain the existing evacuation period. These measures may include programming transportation improvements to increase the capacity of evacuation routes, eliminate congestion at critical links and intersections, adjust traffic signalization or use directional signage, public information programs, or amendments to the Comprehensive Development Master Plan to reduce permitted densities in the areas subject to coastal flooding.

8G. The existing network of designated major evacuation routes shall be kept up-to-date utilizing the regional hurricane evacuation study or the best information available to Dade County.

8H. The Transportation Improvement Program shall include improvements to roadways that would eliminate severe congestion on major evacuation routes and critical links and intersections. All future improvements to evacuation routes shall include remedies for flooding. All local bridges shall be rated by the Florida Department of Transportation for structural and operational sufficiency. All State and local bridges with unsatisfactory sufficiency ratings shall be programmed for improvements, or where necessary, replacement.

8I. The Metro-Dade Transit Agency shall allocate sufficient buses to safely evacuate areas with large concentrations of households without autos such as South Miami Beach. The Office of Emergency Management and Metro-Dade Transit shall study options for securing drivers.

8J. The Dade Office of Emergency Management (OEM) shall maintain and annually update a listing of people with special needs to plan for the mobilization required to safely evacuate and shelter those who may need assistance due to physical or medical limitations. All public shelters should be wheelchair accessible. Special shelters within south, central, and north Dade County should be medically staffed and equipped for those persons in need.

8K. Dade County shall coordinate expansion of its shelter capacity to accommodate the 2000 projection of hurricane evacuees from Dade and Monroe Counties as determined by the best information available. Existing and proposed future public facilities, such as schools, shall be inventoried to identify and designate additional structures suitable for shelters. Public facilities that are used permanently for public shelters shall be listed, mapped, and publicized.

8L. Dade County shall examine incentives for using privately-owned buildings for public shelters and incorporate into its emergency plans a strategy for providing post-disaster shelter and temporary housing to large numbers of disaster victims.

8M. Dade County shall examine the feasibility of requiring, or adding as an option for new residential construction, a structurally reinforced "safe room" for use as a private storm shelter. For existing residences, Dade County shall encourage retrofitting a safe room on a voluntary basis. Dade County shall also explore incentives and other measures to encourage the wind and/or flood hardening of structures.

8N. No new mobile home parks shall be allowed in areas subject to coastal flooding and any new mobile home parks outside the areas subject to coastal flooding shall include one or more permanent structures in accordance with current and applicable building and construction codes for use as shelter during a hurricane. All existing mobile home parks without on-site shelters shall submit a hurricane evacuation plan with shelter designations to the Dade County Office of Emergency Management (OEM).

80. Trees susceptible to damage by sustained tropical storm force winds (39 knots) shall be removed from the rights-of-way of evacuation routes and replaced with suitable, preferably native, species. To strengthen trees planted along roadways and reduce future breakage and blowdowns, the County shall implement an ongoing tree maintenance program of regular trimming and fertilizing and encourage other governments responsible for landscaped roadways to adopt similar tree maintenance programs.

**Objective 9**

By 2000, Dade County shall orient its planning, regulatory, and service programs to direct future population concentrations away from the Coastal High Hazard Area (CHHA) and FEMA "V" Zone. Infrastructure shall be available to serve the existing development and redevelopment proposed in the Land Use Element and population in the CRELA, but shall not be built, expanded, or oversized to promote increased population in the coastal high risk area.

**Policies**

9A. Development and redevelopment activities in the Coastal High Hazard Area (CHHA) and Hurricane Vulnerability Zone (HVZ) shall be limited to those land uses that have acceptable risks to life and property. The basis for determining permitted activities shall include federal, State, and local laws, the pre-disaster study and analysis of the acceptability of various land uses reported in the County's Hazard Mitigation and Post-Disaster Redevelopment Plan required by Policy LOA, when approved, and the following guidelines:

- i) Discourage development on barrier islands and shoreline areas susceptible to destructive storm surge;
- ii) Direct new development and redevelopment to high ground along the Atlantic Coastal Ridge and inland environmentally suitable lands;
- iii) Maintain, or reduce where possible, densities and intensities of new urban development and redevelopment within the CHHA to that of surrounding existing development and zoning. All new residential units in the CHHA, whether year round or seasonal, shall be counted in density and intensity unless certified by recorded covenant that the units will not be occupied during hurricane season;
- iv) Prohibit construction of new mobile home parks and critical facilities in the CHHA;
- v) Prohibit Land Use Plan map amendments or rezoning actions that would increase allowable residential density in the FEMA "V" Zone or on land seaward of the Coastal Construction Control Line (CCCL) established pursuant to Chapter 161, F.S.; and
- vi) Continue to closely monitor new development and redevelopment in areas subject to coastal flooding to implement requirements of the federal flood insurance program.

9B. Land use amendments to the Comprehensive Development Master Plan shall not be approved in Coastal High Hazard Areas if they would decrease Levels of Service on roadways below the LOS standards established in the Transportation Element.



9C. Dade County shall consider undeveloped land in areas most vulnerable to destructive storm surges for public or private recreational uses and open space, including restoration of coastal natural areas.

9D. New facilities which must function during a hurricane, such as hospitals, nursing homes, blood banks, police and fire stations, electrical power generating plants, communication facilities and emergency command centers shall not be permitted in the Coastal High Hazard Area and when practical, shall not be located in the Hurricane Vulnerability Zone.

9F. Public expenditures that subsidize new or expanded infrastructure that would encourage additional population growth in the Coastal High Hazard Areas shall be prohibited. New public facilities shall not be built in the Coastal High Hazard Area, unless they are necessary to protect the health and safety of the existing population or for the following exceptions: public parks, beach or shoreline access; resource protection or restoration; marinas or Ports; or roadways, causeways and bridges necessary to maintain or improve hurricane evacuation times. Potable water and sanitary sewer facilities shall not be oversized to subsidize additional development in the Coastal High Hazard Area.

9G. Dade County shall utilize its Geographic Information System and other forms of mapping of public buildings and infrastructure within the Coastal High Hazard Area and Hurricane Vulnerability Zone to facilitate and expedite pre- and post-disaster decision-making.

**Objective 10**

Reduce the exposure of life and property in Dade County to hurricanes through the planning and implementation of pre-disaster hazard mitigation measures. Pre-disaster planning for post-disaster redevelopment shall direct population concentrations away from the undeveloped designated Coastal High Hazard Areas and away from identified high risk areas during post-disaster redevelopment.

**Policies**

10A. By 2000, Dade County shall complete a Post-Disaster Redevelopment Plan for incorporation into the existing Dade County Hazard Mitigation Plan to provide comprehensive pre-disaster planning for pre- and post-disaster activities, development, and redevelopment.

10B. During pre-disaster planning, hazard mitigation proposals shall be developed by Dade County in conjunction with other agencies and, where appropriate, included in the Comprehensive Development Master Plan.

10C. Prior to post-disaster redevelopment, sources of funds to reconstruct, relocate, or construct new public buildings and infrastructure, consistent with Policy 9F, shall be identified to support and expedite the demands generated by post-disaster reconstruction.

10D. Applications for rezoning, zoning variances or subdivision approvals for all new development in areas subject to coastal flooding shall be reviewed for emergency evacuation, sheltering, hazard mitigation, and post-disaster recovery and redevelopment.

10E. During pre-disaster planning, Dade County shall determine the feasibility of relocating public buildings and infrastructure away from the Coastal High Hazard Area and Hurricane Vulnerability Zone, particularly the FEMA "V" Zone, except as provided in Policy 9F. The County shall develop a formal process and guidelines for evaluating alternatives to the replacement or repair of public facilities damaged by hurricanes such as abandonment, relocation, or repair and reconstruction with structural modifications. The costs; environmental impacts; mitigative effects; community impacts; economic development issues; employment effects; legal issues; consistency with state, regional and local plans; time period for implementation; and availability of funds should be evaluated for each alternative.



10F. The Coastal High Hazard Area (CHHA) and Hurricane Vulnerability Zone (HVZ) boundaries shall be delineated on maps for the unincorporated areas as public information maintained by Dade County. The CHHA and HVZ shall also be delineated on Geographic Information Systems (GIS) and other forms of mapping for the purpose of public information and government planning, administration, emergency management, zoning, and location of public facilities and services in the unincorporated areas of Dade County. This mapping shall be maintained by the appropriate departments.

10G In advance of major storms, Dade County shall identify and map areas suitable and unsuitable for post-disaster relief staging areas, debris storage, disposal or burning. Debris shall not be located in wetland protection areas, wetlands, parklands with adjacent natural areas, Natural Forest Communities, historic sites, or other areas identified as unsuitable for such activities. Debris shall not be burned in the airsheds of Biscayne National Park and Everglades National Park.

**Objective 11**

During post-disaster recovery and redevelopment, Dade County shall implement its Hazard Mitigation and Post-Disaster Redevelopment Plan and applicable CDMP policies and assist hurricane damaged areas with recovery and hazard mitigation measures that reduce the potential for future loss of life and property.

**Policies**

11A. To facilitate post-disaster recovery and redevelopment following a major hurricane and consistent with available personnel and funding, Dade County shall implement the County Hazard Mitigation and Post-Disaster Redevelopment Plan prepared pursuant to Policy bA.

11B. During post-disaster recovery periods, the Dade County Public Works Department, the Office of Emergency Management, the Department of Planning, Development and Regulation and other appropriate agencies shall identify damaged areas requiring rehabilitation or redevelopment; implement the redevelopment plan to reduce or eliminate future exposure of life and property to hurricanes; analyze and recommend to the County Commission hazard mitigation options for damaged areas and public facilities; and recommend amendments, if needed, to the Dade County Comprehensive Development Master Plan.

11C. If rebuilt, structures with damage exceeding 50 percent of pre-storm market value shall be reconstructed to insure compliance with the South Florida Building Code and the requirements of Chapter 11-C of the Dade County Code for structures located in the "V" Zone and the 100-year floodplain. Dade County shall implement uniform spatial and engineering standards for determining if substantial reconstruction is required.

11D. If an area in need of major post-disaster redevelopment is determined to be a high risk area for development, permitted post-disaster densities and intensities shall not exceed the permitted pre-storm densities and intensities.

11E. Dade County shall give priority to the public acquisition of properties in the HVZ and, in particular, in the CHHA that have been destroyed as a result of a hurricane. Dade County shall identify and encourage potential federal and state acquisition programs to assist with the purchase of these properties.

11F. During post-disaster redevelopment, structures which suffer repeated damage to pilings, foundations, or load bearing walls shall be required to rebuild landward of their present location and/or be structurally modified to meet current building codes.

11G. During post-disaster redevelopment the capacities of evacuation routes shall be improved through redesign and reconstruction of the street network, signage, and expansion of public transportation systems and services.

**Objective 11**

During post-disaster recovery and redevelopment, Dade County shall implement its Hazard Mitigation and Post-Disaster Redevelopment Plan and applicable CDMP policies and assist hurricane damaged areas with recovery and hazard mitigation measures that reduce the potential for future loss of life and property.

**Policies**

11A. To facilitate post-disaster recovery and redevelopment following a major hurricane and consistent with available personnel and funding, Dade County shall implement the Counts Hazard Mitigation and Post-Disaster Redevelopment Plan prepared pursuant to Policy bA.

11B. During post-disaster recovery periods, the Dade County Public Works Department, the Office of Emergency Management, the Department of Planning, Development and Regulation and other appropriate agencies shall identify, damaged areas requiring rehabilitation or redevelopment; implement the redevelopment plan to reduce or eliminate future exposure of life and property to hurricanes; analyze and recommend to the County Commission hazard mitigation options for damaged areas and public facilities; and recommend amendments, if needed, to the Dade County Comprehensive Development Master Plan.

11C. If rebuilt, structures with damage exceeding 50 percent of pre-storm market value shall be reconstructed to insure compliance with the South Florida Building Code and the requirements of Chapter 11-C of the Dade County Code for structures located in the "V" Zone and the 100-year floodplain. Dade County shall implement uniform spatial and engineering standards for determining if substantial reconstruction is required.

11D. If an area in need of major post-disaster redevelopment is determined to be a high risk area for development, permitted post-disaster densities and intensities shall not exceed the permitted pre-storm densities and intensities.

11E. Dade County shall give priority to the public acquisition of properties in the HVZ and, in particular, in the CI-IHA that have been destroyed as a result of a hurricane. Dade County shall identify and encourage potential federal and state acquisition programs to assist with the purchase of these properties.

11F. During post-disaster redevelopment, structures which suffer repeated damage to pilings, foundations, or load bearing walls shall be required to rebuild landward of their present location and/or be structurally modified to meet current building codes.

11G. During post-disaster redevelopment the capacities of evacuation routes shall be improved through redesign and reconstruction of the street network, signage, and expansion of public transportation systems and services.

**Objective 12**

Protect, preserve, and sensitively reuse historic resources and increase the number of locally designated historic sites and districts and archaeological sites and zones in the coastal area by 2000.

**Policies**

12C. The County shall improve the protection of historic resources from the damage caused by natural disasters and recovery operations by implementing pre and post-storm hazard mitigation measures and code enforcement.

**INTERGOVERNMENTAL COORDINATION ELEMENT****Policies**

4C. The Miami-Dade County Department of Environmental Resources Management shall continue to coordinate with U.S. Department of Interior and Florida Governor's Office in the refinement, updating and implementation of management policies and regulations for the Big Cypress Preserve and Area of Critical State Concern.

4F. It is the policy of Miami-Dade County that the South Florida Water Management District (SFWMD) shall recognize in its water supply and management planning and permitting processes, Miami-Dade County's adopted population projections, spatial characteristics of the CDMP Land Use Plan map, and policies of the CDMP Land Use, Conservation and Coastal Management Elements. It is further County policy to accommodate future population and economic growth by utilizing the range of water supply technologies outlined under CDMP Water and Sewer Element Objective 6, including traditional sources from expanded and/or new Biscayne Aquifer wellfields, Floridian Aquifer storage and recovery (ASR) techniques, and other alternatives including advanced technologies.

**Objective 8**

Ensure adequate and timely shelter within the region for those residing in hurricane evacuation areas by encouraging all levels of government to work together.

**Policies**

8A. Encourage local governments and federal, State and regional agencies to protect the population by developing a system of emergency communication on roadways including electronically-controlled message signs and a radio station to broadcast highway conditions.

8C. The Miami-Dade County Department of Planning and Zoning and the Office of Emergency Management shall facilitate the coordination of emergency planning issues by increasing interaction.

8D. Encourage local, regional, State and federal agencies and organizations to work together in evaluating the existing criteria for designating places for shelter and reaching consensus. Such criteria should include but not be limited to locations of shelter; structural integrity of shelter; space provided per person; and availability of essential provisions.

8E. Promote the coordination by federal, State and regional agencies of a public information and awareness program concerning various types of hazards and appropriate response.

**CAPITAL IMPROVEMENTS ELEMENT****Objective 2**

Development in high hazard coastal areas will be retained at permitted levels, as of 1 July, 1989.

**Policies**

2A. Public funds will not be used to subsidize increased overall density or intensity of urban development in high hazard coastal areas. However, public beach, shoreline access, resource restoration, port facilities or similar projects may be constructed.

2B. Replacement of infrastructure in high hazard coastal areas will be at or below existing service capacity except where such replacement will improve hurricane evacuation time, mitigate storm damage, or meet regulatory requirements.

**Attachment G****Miami Beach Comprehensive Plan Excerpts Related to Hazard Mitigation****Future Land Use Element**

- Policy 3.2** Within areas designated on the Future Land Use Map as conservation, no new development, or expansion or replacement of existing development shall be permitted except revegetation and construction of a beachfront promenade.

Objective 4 Hurricane Evacuation. Continue to coordinate City (*i.e.*, coastal area) population densities with the Metropolitan Dade County Emergency Operations Plan, which is the local hurricane evacuation plan for Miami Beach, and the Lower southeast Florida Hurricane Evacuation Plan, the regional hurricane evacuation plan by approving no Future Land Use map or zoning map amendments that increase density.

- Policy 4.1** Permitted City population densities shall be reduced to better conform with the 1991 lower Southeast Florida Hurricane Evacuation Study as revised by the U.S. Army Corp of Engineers and the National Hurricane Center.

- Policy 4.2** Permitted city population densities shall be reduced to better conform with the Metropolitan Dade County Offices of Emergency Management's 1991 Emergency Operations Plan and the experience with Hurricane Andrew.

- Policy 8.1** The City shall continue to require that first floor elevations be constructed at 8.33 to 11.0 feet at mean low tide to allow maximum protection during flood conditions. This provision shall not apply within Historic Preservation Districts where first floor elevations may be set below 8.33 feet, but shall be set at the highest level consistent with the historic character of the area.

**Transportation Element**

- Policy 5.2** The City shall use design review procedures in the land development regulations to control roadway access points in conjunction with development. Such procedures shall include provisions requiring that all access points on state roads be approved by the Florida Department of Transportation, that all access points on county roads be approved by the Dade County Road Commission and that all other access points be in accordance with the best professional standards consistent with the protection of property rights. The City shall eliminate or minimize roadway designs which lead to hazardous conditions by:

5) requiring adequate capacity for emergency evacuation or emergency response vehicles.

Objective 7 Improving Hurricane Evacuation. To improve hurricane evacuation within the City of Miami Beach, the City shall coordinate with responsible agencies including the Florida Department of Community Affairs, Miami-Dade Office of Emergency Management, South Florida Regional Planning Council and Miami-Dade Transit Authority.

**Policy 7.1** The City of Miami Beach will continue its efforts to establish shelters of last resort within the City to assist with hurricane evacuation through coordination with Miami-Dade Office of Emergency Management.

**Policy 7.3** The City shall coordinate with the Miami-Dade Office of Emergency Management to improve evacuation clearance times of 5th Street/Alton Road through a change to the hurricane evacuation route zones to take advantage of available capacity on alternative evacuation routes.

**Policy 7.4** The City shall evaluate entering into an agreement with a private contractor to assist with evacuation including during hurricane events.

**Infrastructure Element**

Objective 4 Flood Plain Management. Enforce minimum floor level building elevations.

**Policy 4.1** Continue site plan review for new construction with the requirement that the minimum first floor elevation for living quarters be at least 8.8 feet at MLW (U.S.E.D.) Bay Datum) allowing for maximum protection during flood conditions.

**Conservation / Coastal Zone Management Element**

**GOAL:** Provide public improvements and restrict development activities that would damage or destroy coastal resources, protect human life and limit public expenditures in areas subject to destruction by natural disasters in a manner maintaining or improving the marine and terrestrial animal habitats, vegetation, land, air, water, and the visual, aesthetic quality of Miami Beach for present and projected, future populations.

Objective 1 Beaches and Dunes. Use established standards so that there are zero new man-made structures which adversely impact beach or dune system; also restore altered beaches or dunes by implementing the following policies.

**Policy 1.2** Beaches shall be stabilized when necessary by the County program of planting appropriate dune vegetation; pedestrian impacts shall be minimized by providing elevated footpaths where feasible. All subsequent

activities on or bordering the restored beach shall be compatible with beach maintenance; the City will continue to cooperate with the County.

**Policy 2.22** By the year 1995, the City shall adopt an emergency water conservation plan, through a water shortage ordinance, consistent with the policies of the South Florida Water Management District.

**Policy 2.23** The City shall continue the policy of ensuring the protection of natural areas and open space through public acquisition of land.

Objective 4 Hurricane Evacuation. The existing time period required to complete the evacuation of people from Miami Beach prior to the arrival of sustained gale force winds shall be maintained or lowered by 1995.

**Policy 4.1** All future improvements to evacuation routes shall include remedies for flooding problems and the anticipated increase in the level of the water of Biscayne Bay as has been done in the recent Mac Arthur Causeway improvements.

**Policy 4.2** The Miami Beach Hurricane Handbook will be distributed to the general public with detailed emergency operation instructions and hurricane evacuation pick-up sites.

**Policy 4.4** All trees susceptible to damage by gale force winds as evidenced by Hurricane Andrew shall be removed from the right-of-way of evacuation routes and replaced with suitable species.

**Policy 4.5** The City will coordinate with Metro-Dade Transit Agency and the Office of Emergency Management to ensure that adequate buses are available to safely evacuate neighborhoods with large concentrations of households without private transportation.

**Policy 4.6** The City of Miami Beach Fire Department shall maintain and annually update the list of people who may need assistance due to physical or medical limitations in the event of an evacuation order to ensure their safe mobilization.

**Policy 4.7** The City of Miami Beach Fire Department shall review and update the Miami Beach Hurricane Evacuation Plan by 1995 based upon the experience of Hurricane Andrew and maintain or enhance the resources and capabilities of the plan to provide effective implementation of evacuation procedures to ensure that evacuation times are maintained or reduced.

**Policy 4.9** Selected City population density maximums shall be reduced as a part of this Plan to better coordinate with the 1991 Metropolitan Dade County Emergency Operations Plan, which is the local hurricane evacuation

plan for Miami Beach, and the 1991 Lower Southeast Florida Hurricane Evacuation Plan, the regional hurricane evacuation plan.

- Policy 5.1** Except as provided in Policy 5.2 below, the City shall not fund any public infrastructure capacity expansion if such funding and such expansion would have the effect of directly subsidizing a private development.
- Policy 5.4** New private use facilities along the beach shall conform to the strict setback, open space and accessory use requirements of Sections 5, 6 and 15 of the Land Development Regulations as well as the requirements of the floodplain ordinance.
- Policy 5.5** By 1998, the City shall adopt a post-disaster redevelopment plan based on the experiences of Hurricane Andrew. It shall specify that structures which suffer repeated damage to pilings, foundations or load bearing walls and/or incur damage exceeding 50% of their assessed value shall rebuild to the requirements of all current development regulations, and shall not be located east of the coastal construction control line. No redevelopment shall be permitted in areas of repeated damage unless it is determined by the City of Miami Beach officials to be in the public interest.
- Policy 5.6** The adopted plan shall specify that during post-disaster redevelopment, the Building Department will distinguish between those actions needed to protect public health and safety with immediate repair/cleanup and long term repair activities and redevelopment areas. Removal or relocation of damaged infrastructure and unsafe structures shall be by the Miami Beach Public Services Department in accordance with local procedures and those agencies and practices specified in the Metro-Dade County Emergency Operations Plan.
- Policy 5.7** During post-disaster recovery periods, after damaged areas and infrastructure requiring rehabilitation or redevelopment have been identified, appropriate City departments shall use the post-disaster redevelopment plan to reduce or eliminate the future exposure of life and property to hurricanes; incorporate recommendations of interagency hazard mitigation reports; analyze and recommend to the City Commission hazard mitigation options for damaged public facilities; and recommend amendments, if required, to the City's Comprehensive Plan.
- Policy 5.8** Unsafe conditions and inappropriate uses identified in the post-disaster recovery phase will be eliminated as opportunities arise, in accordance with the plan to be adopted by 1998.



Objective 8 Infrastructure Capacity Expansion. Limit public infrastructure expenditures that subsidize development in the City-wide Coastal High Hazard Area except for restoration and enhancement of natural resources; the measure shall be 0 projects inconsistent with Policies 6.1 through 6.5 and 8.1 and 8.2 in the Capital Improvement Schedule.

**Policy 8.1** Except as provided in Policy 8.2 below and in Policies 6.1 through 6.5 and 8.1 of the Capital Improvements Element, the City shall not fund any public infrastructure capacity expansion if such funding and such expansion would have the effect of directly subsidizing a private development.

Objective 9 Density Limits. Population concentrations away from city-wide coastal high hazard area by prohibiting residential density increases.

Objective 11 Historic Uses. The City shall use its adopted land development code to protect historic resources. Historic resources shall be protected to the maximum extent consistent with constitutional property rights and any specific goals, objectives and policies of this comprehensive Plan which may be inconsistent therewith.

**Recreation and Open Space Element**

**Policy 4.5** To ensure environmental sustainability, protection of natural areas and quality of urban life by the public acquisition of land for use as publicly accessible urban greenspace and scenic open space vistas.

**Capital Improvements Element**

**Policy 1.2** The City will continue its program of regularly scheduled inspections of all capital facilities, coordinated by the Department of Design, Development and Historic Preservation Services, to monitor and record the condition of each.

Objective 6 Limit public infrastructure expenditures that subsidize development in the City-wide Coastal High Hazard Area except for restoration and enhancement of natural resources; the measure shall be 0 projects inconsistent with Policies 6.1 through 6.5 and 8.1 in the Capital Improvement Schedule.

**Policy 6.1** Except as provided in Policy 6.2 through 6.5 below, the City shall not fund any public infrastructure capacity expansion if such funding and such expansion would have the effect of directly subsidizing a private development.

**Policy 6.5** The City will continue to expend funds as needed to maintain, repair, renew, replace or expand facilities that protect the dune system or other environmental assets.

**Historic Preservation Element**

- Policy 1.4** By 1994, expand the City's Design Guidelines to specifically address the rehabilitation of historic preservation sites or contributing structures within designated local Historic Preservation Districts.
- Policy 2.2** Provide funding to subsidize the rehabilitation of existing hotels and the construction of a new hotel or hotels in the City Center/Historic Convention Village Area which are designed to be sensitive to the historic character of the area.
- Policy 2.3** By 1994, adopt a master plan for the redevelopment of Lincoln Road as a historic cultural and retail center and create a financing mechanism to implement the plan.