Local Mitigation Strategy

LMS
Miami-Dade

Whole Community
Hazard Mitigation

December 2012

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INTRODUCTION

Miami-Dade County is made up of thirty-five municipalities plus a large unincorporated area referred to as the "Unincorporated Municipal Services Area" (UMSA). While referred to as cities throughout this document, officially, some are cities, others are towns and still others are villages. These municipalities consist of both coastal and inland communities; urban, suburban and rural communities; communities that are heavily industrialized, some with an agricultural base and those that are almost completely residential. The county has two of the five largest cities in the state of Florida (Miami and Hialeah)). Miami-Dade County has a metropolitan form of government with its own Home Rule Charter. When the Board of County Commissioners passes a resolution or ordinance, that action automatically includes all the municipalities within the county. In the event a municipality does not wish to participate in the action, that municipality must, through their own resolution, opt out. For example, when the BCC adopted this Local Mitigation Strategy, the municipalities were automatically included and none opted out.

In the spring of 1998, the state of Florida contracted with and provided funding to each of the counties within the state to develop a LMS. Miami-Dade County is a highly diverse community yet because of a hurricane named Andrew we all have a profound appreciation for hazard mitigation and a willingness to make the "Strategy" work. Consequently, all of the municipalities in Miami-Dade County have participated in the LMS at one time or another and have formed, with many other organizations, what we refer to as the LMS Working Group.

The LMS Working Group

During the development of the LMS each municipality designated a representative to the Working Group. Additionally, each of the major departments within the county government assigned a representative to the Working Group to address the issues of the unincorporated portions of the county and the county owned and operated facilities that lie within the boundaries of the municipalities. In order to streamline planning, the Working Group was divided into seven subgroups, which, for convenience sake, used the groupings that were already in place within the county as "divisional emergency operations centers" (DEOC) and are loosely based upon geographical proximity. The subgroups are as follows (with new cities added where appropriate):

Group 1: Aventura, Bal Harbour, Golden Beach, Miami Gardens, North Miami Beach and Sunny Isles Beach.

Group 2: Bay Harbor Islands, Biscayne Park, Indian Creek Village, North Miami and Surfside.

Group 3: Doral, Hialeah, Hialeah Gardens, Medley, Miami Lakes, Miami Springs, Opa-Locka and Virginia Gardens.

Group 4: El Portal, Key Biscayne, Miami, Miami Beach, Miami Shores and North Bay Village.

Group 5: Coral Gables, Palmetto Bay, Pinecrest, South Miami, Sweetwater, West Miami and the University of Miami.

Group 6: Cutler Bay, Florida City, Homestead, and the Miccosukee Tribe of Indians of Florida.

Group 7: Miami-Dade County departments, divisions and offices – offices and divisions that operate fairly independently of their parent department act on their own in the LMS Working Group.

The subgroups listed above were a means to collaborate the planning efforts of the Working Group in the initial phases of the development of the LMS. Once the LMS was operational, the need to organize based on the divisional groupings became less and less necessary. While the use of the subgroups is no longer an apparent part of the LMS's operations, most of the original members of the LMS have maintained their membership within the program. Currently, any planning and program development issues are addressed through as-needed Steering Committee (see page 3) meetings and in an open forum through the quarterly meetings that are held four times a year.

Other active participants in the Working Group include state and federal agencies, colleges, universities and schools (including the Miami-Dade County Public Schools), hospitals, not-for-profit organizations and private sector companies.

The makeup of the Working Group is not limited to the any particular organization or jurisdiction. Numerous others have expressed the desire to participate in the Local Mitigation Strategy and are welcome to do so. It has been asked why federal and state agencies and private sector companies should participate in the LMS. Well, the answer is easy: They live here and work here, too; our disasters are their disasters.

Each organization, (municipality, county department or other participating organization) appoints an official representative to the Working Group who will vote on behalf of the organization and will be the "voice" of the organization. Each organization is encouraged to solicit participation and commentary from its citizens, employees and members.

It must be noted, however, that to be considered a participant of the Local Mitigation Strategy and receive the benefits thereof, a municipality, county department or any other organization must attend at least two of the four quarterly meetings held each year. The Working Group endorsed this policy unanimously on September 20, 2001. However, any organization may substitute regular participation and attendance on an active LMS committee or subcommittee in lieu of attendance at the quarterly meetings.

Although the state of Florida's LMS development contract with Miami-Dade County and its municipalities officially terminated in August of 1999 there was a presumption in both the contract and in the publication *The Local Mitigation Strategy: A Guidebook for Florida Cities and Counties* that the Working Group or other successor entity would continue in some form far beyond that date. The requirement for the development of evaluation criteria and review and revision policies implies continuity, as does a long-term conflict resolution policy utilizing the Working Group as part of the process. In any event, the continuation of the Working Group has been addressed as part of the Local Mitigation Strategy even though not required by the contract.

LMS Committees

In order to streamline the Working Group's activities, various committees may be formed, each addressing an area of concern. Initially, committees were formed to deal with flooding, evacuations, funding, community education, external policy, agriculture and wildfires. Other committees may be formed as needed. To act as a "board-of-directors" and to guide policy between meetings of the Working Group, a Steering Committee was formed with members representing the organizations found within the Working Group (i.e. municipal, county, educational, not-for-profit and private sectors). The Steering Committee acts as a review committee for the establishment of this Local Mitigation Strategy and the prioritization of the projects therein. Membership on any committee shall be voluntary and subject to the review and approval of the Working Group. A committee member who fails to attend a reasonable number of committee meetings may be dropped from participation in the committee by a majority vote of the other members of that committee. As stated above, serving on a committee may act in lieu of attendance at the quarterly LMS meetings.

Program Continuity and Meetings

In September 1999, The Miami-Dade County Local Mitigation Working Group voted to continue the LMS program with or without state funding. The Steering Committee will meet as needed and the full Working Group will meet once each calendar quarter. Working Group meetings will be noticed by e-mail to the official representative of each jurisdiction and to other interested parties. The representatives are encouraged to post meeting notifications prominently, on community bulletin boards or in some other way, to notify the public or other interested parties at least thirty days prior to each meeting. Meeting times, dates and locations will also be posted on the LMS website: www.miamidade.gov/oem/lms.asp.

In March 2000, the Working Group determined that the LMS master document needed to be updated two to three times each year and the updates, including the deletion of completed or abandoned projects, the addition of new projects and amendments to existing projects, will be published and forwarded to the Florida Division of Emergency Management. In December 2000 it was finally agreed to by the Working Group that the

LMS master document would be updated and published on June 30th and December 31st of each year.

The LMS Coordinator working through the Miami-Dade Emergency Management (MDEM), with the assistance of the LMS Steering Committee, and input from the LMS Working Group, will undertake to organize the updates and monitor the plan. Document monitoring will be based on factors such as current disaster events, changes in local, state, and federal policies and legislation, and the bi-annual updates. In addition, the elements listed within the "Evaluation Criteria and Procedures to Review and Revise the LMS" section of document will also be used as monitoring criteria for this document. The monitoring of this document will be perpetual to ensure that current and appropriate information is included. With regard to updates, all additions, deletions and amendments must be received at MDEM at least thirty days prior to each agreed upon publication date or risk not being included in the final publication for that time period. As part of the update and monitoring process, any changes provided to MDEM will be reviewed and compared against the FEMA 5-year crosswalk. If appropriate, proposed comments will be included in the plan by the LMS Coordinator. The bi-annual updates of this plan are part of the 5-year update. The culmination of the bi-annual updates will be reflected in the 5-year submittal of this plan. The updated plan will be submitted to the State for review approximately 6 months prior to its expiration. Ultimately, all changes and revisions to this document will be completed by the LMS Coordinator. The revision of this document will follow the criteria outlined in the "Evaluation Criteria and Procedures to Review and Revise the LMS" section of this document.

At all times, including for the 5-year submittal, the latest published version of the Local Mitigation Strategy will be posted on the Miami-Dade County Internet website – www.miamidade.gov/oem/lms.asp – for public scrutiny and commentary. Any comments received through this medium will be incorporated through the revision process identified above. An email address, mdlms@miamidade.gov, has been established for such commentary, which is strongly encouraged; let us hear from you.

On June 6, 2000 the Miami-Dade Board of County Commissioners passed Resolution R-572-00 formally adopting the Local Mitigation Strategy as official county policy thus further promoting program continuity. Because Miami-Dade County has a metropolitan form of government, this means that each of the municipalities within the county has also automatically adopted the LMS unless they choose not to and to date, none have opted out. As per requirements of the 5-year review of this document, the Board of County Commissioners must adopt the updated plan following FEMA's approval.

On September 13, 2000 Miami-Dade County, along with its municipalities and other organizations was designated by FEMA and the Florida Department of Community Affairs to be a "Project Impact Community." At the December 6, 2000 meeting of the LMS Working Group, it was agreed that the LMS Working Group would become the Project Impact Working Group and that the Local Mitigation Strategy would continue under the auspices of Project Impact. Henceforth, Project Impact and the Local Mitigation Strate-

gy became synonymous. Additionally, the LMS Steering Committee will continue its functions under Project Impact. On May 30, 2001, a formal "signing ceremony" took place at Vizcaya Museum and Gardens when many members of the Working Group signed a proclamation, each becoming a "Project Impact Partner." Although FEMA no longer endorses Project Impact, it has indicated that it will not abandon the Project Impact communities as long as their grants are still in effect. Conversations within the Working Group indicate that the Project Impact concept will continue in Miami-Dade County regardless of what it is called.

On June 7, 2005, the Miami-Dade Board of County Commissioners passed Resolution R-710-05, which states that grant applications filed under the auspices of the Miami-Dade Local Mitigation Strategy no longer have to go to the Commission for approval, but instead authorizes the county manager to "*Apply for, receive, expend and amend applications for grant funds for projects listed in the Miami-Dade County Local Mitigation Strategy."*

In June of 2008, the LMS Working Group celebrated its 10th anniversary with over 300 completed mitigation projects at a value exceeding 250 million dollars. As of this publication there are nearly $20 million in Pre-Disaster Mitigation (PDM) program projects that have now been completed and millions more in Hazard Mitigation Grants Program (HMGP) still in progress from the 2004 and 2005 hurricane seasons. The HMGP funding that became available as a result of Hurricanes Katrina and Wilma in 2005 has led to significant mitigation advances now under construction. A catalog of completed LMS projects may be found at the LMS website: http://www.miamidade.gov/fire/mitigation.asp.

How to use this Document

The Local Mitigation Strategy establishes Miami-Dade County's overall mitigation policy. This document includes the strategy for mitigation, proposed mitigation projects and how they are prioritized, sources of funding, and other supporting information relative to mitigation. This document also serves as a reference tool for those seeking to understand the vulnerabilities that exist within Miami-Dade County. In addition, the "Projects" section of this plan is helpful for providing examples of proposed mitigation projects to mitigate against hazards that have a countywide impact. Due to the subject matter contained herein, the content of the LMS is reflected in other documents in the county such as the Miami-Dade County Comprehensive Emergency Management Plan. The LMS is used by member entities to justify short and long-term budget requests. For example, the Miami –Dade Division of Environmental Resources Management (DERM) has a long-term line item in its budget to fund the mitigation of repetitive loss areas. The list of projects to be funded comes from the 'wish list' that DERM has in the LMS. Other departments that use this document include Risk Management and Planning and Zoning. Elements of this document are used by Risk Management to identify the full scope of mitigation activities and potential insurance savings. Additionally, this document

benefits Planning and Zoning in that it provides updated information regarding mitigation activities; thereby, facilitating appropriate Comprehensive Development Master Plan update efforts. Furthermore, since this "Strategy" encompasses Miami-Dade County as whole, interested parties are encouraged to use it as a reference document in developing relevant plans that address mitigation. Such plans may include municipal CEMPs, evacuation plans, continuity of operations plans, etc.

The LMS is updated twice a year and each change is tracked as part of the review process. These changes are looked at to determine their impact on other planning documents. These changes are shared with stakeholder entities to ensure that they incorporate them into their planning documents as necessary. This process facilitates consistency among all planning documents related to mitigation.

This document is divided into seven parts:

Part 1 - Strategy
Part 2 - Projects
Part 3 – Funding
Part 4 - Appendices
Part 5 - Meeting Minutes
Part 6 - Completed Projects
Part 7 – LMS Progress Report - Activity 510

Parts 1, 3 and 4 are contained within this document and Parts 2, 5, 6, and 7 are published separately.

All of the these sections are published on the LMS website:
http://www.miamidade.gov/fire/mitigation.asp.

PART 1 – THE STRATEGY

Guiding Principles

Federal, State and Regional Governmental Entities

The federal, state and local entities that perform hazard mitigation functions are almost too numerous to name. However, some of the more prominent ones are: the Federal Emergency Management Agency (FEMA), the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), U. S. Army Corps of Engineers (USACE), Natural Resources Conservation Service (NRCS), Florida Division of Emergency Management (FDEM), Florida Department of Community Affairs (DCA), Florida Department of Transportation (FDOT), South Florida Water Management District (SFWMD) and many more.

The government entities that are located in and affect Miami-Dade County and its municipalities that perform hazard mitigation functions are varied and represent all levels of government: federal, state, county and local.

The Federal Emergency Management Agency has funded hundreds of hazard mitigation projects following Hurricane Andrew and to a lesser extent following the 1993 March windstorm or "Storm of the Century," the February, 1998 "Groundhog Day" storms and more projects have been implemented following Hurricane Irene in 1999 and the October 3, 2000 floods (pre-Tropical Storm Leslie), the tornados of March 27, 2003, the hurricanes of 2004 (Charley, Frances, Ivan and Jeanne) and most recently: Katrina, Rita and Wilma in 2005 and Tropical Storm Fay in 2008. FEMA also delves deeply into mitigation as administrator of the National Flood Insurance Program to which all municipalities in Miami-Dade County are part.

The U. S. Army Corps of Engineers is responsible for restoration and renourishment of most of the county's beaches, maintenance of the Intracoastal Waterway, maintenance of Government Cut and the Miami Harbor entrance, and some shared responsibility with the South Florida Water Management District for the canal and levee systems throughout the county. Mitigation functions in these areas by the Corps are multiple and varied.

The South Florida Water Management District maintains canal, pumping, and drainage systems throughout the county and controls when control structures are opened and closed thus flood control mitigation opportunities exist to benefit all of South Florida. These structures, located throughout the county, also mitigate against saltwater intrusion into the Biscayne Aquifer from which our drinking water is supplied.

The United States National Park Service controls Everglades National Park that covers one third of the land area of Miami-Dade County and Biscayne National Park that covers over half of Biscayne Bay.

The Florida Department of Environmental Protection oversees considerable flood plain management and also controls the state park system, two of which, Oleta River and Bill Baggs Cape Florida State Recreation Areas, lie within Miami-Dade County; state parks that are vulnerable to hurricanes and storm surge because of their locations, one on Biscayne Bay and the Intracoastal Waterway and the other on Key Biscayne, a barrier island.

The United States Department of Agriculture's Farm Service Agency provides assistance to the farming community similar to that which FEMA provides to counties and municipalities. Also, the Natural Resources Conservation Service (formerly Soil Conservation Service) helps with mitigation such as canal bank restoration and stabilization.

The United States Forestry Service and the Florida Division of Forestry both keep fire trails and fire breaks open, conduct controlled or prescribed burns and assist with debris clearance, all of which mitigate and facilitate fire control by keeping fuel levels low.

The Florida Department of Transportation must be a major participant in any mitigation endeavors undertaken throughout the county. They, along with the Miami-Dade Expressway Authority, maintain and control our major thoroughfares including the expressway system. They also control, along with Miami-Dade County Public Works, Florida East Coast and CSX railroads and the Town of Bay Harbor Islands, the twenty-three movable bridges that cross the Miami River and the Intracoastal Waterway.

Municipal Agencies and Their Mitigation Functions

The municipalities of Miami-Dade County each have within their makeup certain departments and agencies which affect and promote mitigation. While these agencies may have slightly different names from city to city, the role they perform in the mitigation function remains the same (e.g. public works or public services or community services, etc.).

Police and fire rescue departments: Each of the municipalities except Miami Lakes, Palmetto Bay and Cutler Bay maintains its own Police Department while the cities of Coral Gables, Hialeah, Key Biscayne, Miami and Miami Beach also maintain their own fire departments with the balance of the cities using Miami-Dade Fire Rescue for this service. While these departments, except for their own buildings, do not truly do mitigation as it pertains to this strategy, they can be an extremely helpful as sources of information because they are the first responders to most of our hazard events and their insights into preventive measures can be invaluable. The police and fire departments also conduct educational seminars to residents to spread awareness on emergency preparedness.

The building department (or building & zoning): The functions of this department relate extensively to a wide range of mitigation projects and on-going mitigation activities. In

most of our cities, the Building Official is responsible for interpreting and enforcing all laws, codes, ordinances, regulations and municipal policies related to the construction, improvement, expansion, repair or rehabilitation of buildings within the city. This department ensures that all new construction complies with the Florida Building Code which in itself is a major contribution to hazard mitigation. The department usually is responsible for the prevention of development in Special Hazard Areas; preservation of open space; general control of land use intensities; and coordination between the capacity of public infrastructure in relation to proposals of private development. This department also ensures all proposed development in the city conforms to the city's comprehensive plan as it relates to urban design of public areas and buildings, infrastructure planning and maintenance of flood data and other statistical information.

Planning and Development Department: Often is a part of the building department and even, at times, a part of public works. However, a number of our municipalities maintain planning and development as a separate entity which interacts within the mitigation strategy in many ways and must be part of the overall strategy especially in the area of urban land use.

Public Works Department: In most of our cities this department is responsible for construction and maintenance of roads, bridges and waterways and storm water management including drainage system development, inspection and maintenance, all functions that relate in various ways to hazard mitigation. Public works activities are a major component of any mitigation strategy.

Mitigation Goals and Objectives

In a community as large and diverse as metropolitan Miami-Dade County no single list is going to include every conceivable mitigation goal or objective. However, we can start with the philosophies necessary to bring the community together as a single mitigating entity.

Mitigation goals and objectives must be consistent with the goals and objectives of the county and the individual municipalities' master plans, their codes and ordinances, as well as other endeavors that reflect the aspirations for the welfare, safety and quality of life of their citizens.

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 the FEMA National Flood Insurance Program (NFIP) 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. 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. 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. 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.

Policies, Ordinances and Programs Affecting Mitigation

Each municipality is similar in that it is located in Miami-Dade County, Florida. The same federal, state and county laws govern each. Each individual municipality is unique and has its own municipal ordinances, policies, procedures, and programs that differ according to specific needs and priorities. The basic federal, state and county documents affecting hazard mitigation listed are generally applicable throughout the municipalities. Other documents vary; therefore data sources for each have been listed according to the respective municipal government. Adherence to these policies, ordinances and programs is an integral part of the Miami-Dade LMS.

There are many federal, state and county laws and policies that affect hazard mitigation and all the members of the Working Group. Some of those are:

Federal:

1. The Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288 as amended (The Stafford Act) is interpreted by Title 44 of the Code of Federal Regulation (44 CFR) and governs FEMA and emergency management and sets forth the federal concepts for hazard mitigation. It also defines the Coastal Barriers Resources Act (44 CFR 206 subpart J) and describes floodplain and environmental management (Parts 9 and 10). The Disaster Mitigation Act of 2000 (DMA-2K) has also redefined much of this and those changes have been incorporated into this document. Much of FEMA has been further redefined by the "Post-Katrina Emergency Management Reform Act of 2006," which was enacted by Congress and signed into law by the President in the fall of 2006.

1. The National Flood Insurance Program (NFIP) and the Community Rating System (CRS) FLA-15, July 1996, sets up a community rating system for flood insurance offering incentives for communities and credits for eighteen floodplain management activities.

2. National Fire Code, 1993 and NFPA 101 Life Safety Code define uniform fire safety standards adopted by rule by the State Fire Marshal.

3. Title 15 of the Code of Federal Regulations, which defines the Coastal Zone Management Act (15 CFR Parts 923 and 930).

4. Title 40 of the Code of Federal Regulation which defines the National Environmental Policy Act including such mitigation measures as included in the National Emission Standards for Hazardous Air Pollutants (Part 61), Toxic Substances Control Act (Part 763), the Resource Conservation and Recovery Act and CERCLA (the Superfund).

5. Title 29 of the Code of Federal Regulations that defines the Occupational Safety and Health Act containing many hazard mitigation measures.

6. Presidential Decision Directives 39 and 62 are the authorities directing the development of terrorism response.

State:

1. State of Florida laws which are pertinent to hazard mitigation include:

   a. Chapter 161 – Beach and Shore Preservation

   b. Chapter 255 – Public Property and Public Buildings

   c. Chapter 373 – Water Resources

   d. Chapter 403 – Environment Controls

2. The South Florida Water Management District provides guidelines that control the canal network within Miami-Dade County and its municipalities.

3. South Florida Fire Prevention Code 1992-93 (adopted by the County Commission) defines standards for fire prevention and allows controlled burns as mitigation.

County:

1. Board of County Commission Resolutions

   a. R-572-00, which establishes the Miami-Dade Local Mitigation Strategy as official county policy
   b. R-710-05, which authorizes the county manager to apply for, receive, expend and amend applications for projects listed in the Miami-Dade Local Mitigation Strategy.

2. Pertinent Miami-Dade County laws include codes and ordinances that govern municipal activities, as follows:

a. Chapter 8(b) of the county code, which deals with emergency management;

b. Chapter 17, i.e. the Housing Code, focused on maintaining the housing stock in decent safe and sanitary conditions;

c. Chapter 24 covering the activities of the Miami-Dade Division Environmental Resources Management (DERM) for permitting hazardous materials;

d. Chapter 28 of the county code which deals with subdivision regulations;

e. Floodplain Management Program sets the criteria for elevations and assesses the risks for flooding for different areas of the County;

f. Miami-Dade County Comprehensive Emergency Management Plan mandates that municipalities have emergency management plans, as well as recommends the performance of hazard mitigation activities;

g. Miami-Dade County Comprehensive Land Use Plan dictates current land use and controls future land use and growth throughout the county;

h. The Public Works Manual, especially Section D5, concerning coastal construction;

i. Dade County Environmental Protection Ordinance, Coastal and Freshwater Wetlands Regulations, Sections 24-58 and 24-59.

3. Miami-Dade County Landscape Maintenance Special Taxing Districts provide tree-trimming programs that prevent more severe damage during windstorms.

4. Miami-Dade County and all of the municipalities use the Florida Building Code (FBC), adopted in March 2002, as a standard. In deference to the South Florida Building Code that it replaced, the High Velocity Hurricane Zone portion of the FBC applies to Miami-Dade and Broward Counties and allows for stricter design and construction measures in addition to ASCE 7-98, especially the requirements to protect windows, walls and roofs from wind-born debris.

5. The Local Law Enforcement Mutual Aid Agreement with Miami-Dade County designed to coordinate and supplement local resources.

6. The Statewide Mutual Aid Agreement for Catastrophic Disaster Response and Recovery establishes a local resource for all Working Group members that are presently signatories.

Municipalities:

a. The Basic Emergency Management Plan sets forth the procedure for all activities of the municipality before, during and after emergencies.

b. A Stormwater Management Plan, which is focused on flood-related hazards and defines the relevant mitigation goals, evaluates appropriate and feasible mitigation measures and prioritizes such measures into an Action Plan for systematic implementation.

c. A Floodplain Management Plan governing development in the floodplain. All cities within the county are striving to establish a floodplain management plan and participate in the Community Rating System. NFIP has stated that this document, the Local Mitigation Strategy, may serve as a floodplain management plan for its participants.

d. A Comprehensive Land Use Plan controlling growth and development within the municipality.

Effectiveness Evaluation

Following Hurricane Andrew in 1992 and continuing for several years thereafter, the county government and the governments of most of the municipalities did an in depth evaluation of existing policies, ordinances and programs. The big question was "why was the damage so severe?" And, "what could we have done to prevent this extent of damage?"

As a result of the evaluations, many revisions came to pass, especially in the Florida Building Code. As noted in the previous section, the load standards of section 6 of the American Society of Civil Engineers Standard 7-88 were adopted as part of the code. New measures for community protection came to be. For example, storm shutters must now pass certain impact tests; in fact, storm shutters or other type window protection are now required on all new buildings. Requiring heavier decking, tighter nailing and stronger internal bracing has strengthened roof structures. These tougher standards remain in effect in Miami-Dade County in the new Florida Building Code and especially in the High Velocity Hurricane Zone section thereof. (Note: At the 2003 National Hurricane Conference in New Orleans the Miami-Dade Building Code Compliance Office was presented the national award for mitigation for their fight to retain the tougher, stricter building codes.)

The Miami-Dade LMS calls for an "evaluation of existing municipal mitigation policies, ordinances and programs." Hurricane Andrew forced it. South Florida is still in the process of this evaluation and a continuous effort to increase the effectiveness of these programs. Many recommendations are included in the aforementioned FEMA pub-

lication: *Building Performance: Hurricane Andrew in Florida.* This has all been built into our version of the Local Mitigation Strategy.

Analysis of Existing Policies, Ordinances and Programs

The achievement of the mitigation goals and objectives of the community presupposes clear goals and measurable objectives, both with consensus support from the county and the municipalities. The ability of existing policies, ordinances, and programs to help the community achieve its goals and reach its objectives can only be analyzed at this time if certain assumptions are made regarding what the goals and objectives are to be. Thus, the following assumptions are made: Municipal governments' ordinances, policies and programs will continue to be the primary tools used to effectuate hazard mitigation projects; funding for hazard mitigation projects will continue to be provided by state and federal sources; the goal of reducing the cost to the community, both monetary and human, of future hazards is primary in determining what policies to adopt, what programs to implement, and what objectives to measure.

Based on the above assumptions, the challenge of "strengthening" existing policies, ordinances and programs is not to improve or increase them, but to clarify, simplify and prioritize them in a way that persuades local government to place more emphasis on implementing them. In addition, local programs designed to understand and take advantage of state and federal funding opportunities must be emphasized. Finally, the appropriation of funds needs to maximize the reduction of costs to the community of future hazards.

As the population grows in Miami-Dade County, hazard mitigation laws must prevent new structures from being built in areas susceptible to unusual occurrences. For example, new building construction in low lying flood areas must be limited or built in such a manner to withstand flooding or wind damage. Similarly, future construction sites of natural gas, electrical and nuclear power plants must have mechanisms in place that will self-contain, or significantly limit, effects of potential catastrophic incidents.

Local government and the private sector must provide ongoing training and information sessions for the public. Clear, unbiased knowledge is a key ingredient for safety enhancement for the public. Ongoing training could include public information notices and continuous training sessions at local libraries, hospitals and schools. Part of the cost for this training should be borne by those private parties who ask or have businesses that may contribute to an unusual occurrence. For example, construction of a new electrical substation, a natural gas company building a new facility, a professional dry cleaner establishment, a new gas station, etc. would have impact fees assessed to offset the mitigation training costs.

Training and equipment to prepare for and subsequently resolve hazard situations are necessary and vital. Alternative financial resources must be assessed and located in addition to including these costs in all respective governmental budgets.

Periodic review and revision of the local government ordinances, policies and programs must occur no less than once every other year.

Each municipality that has not yet done so should adopt a floodplain management ordinance and participate in the community rating system program. At the present time, the Miami-Dade Local Mitigation Strategy will serve as a floodplain management plan if adopted by a municipality.

Measuring the Overall Effectiveness of the LMS Program

Measuring the effectiveness of mitigation activities presents several challenges for the simple reason that hazards do not always have similar characteristics in future occurrences. Therefore, applying a one-size-fits-all standard for measuring mitigation success may not always produce comparable results from year to year due to shifting characteristics of hazard impact, demographics, exposure, etc. However, since this program has identified goals, the effectiveness of this program will be measured, to the extent possible, against progress being made toward meeting those goals. As such, several matrices are used within this program to assess progress. The LMS Coordinator regularly monitors attendance and participation of the Working Group. This is done through sign-in sheets at quarterly meetings and submittal of mitigation projects for inclusion in the LMS document. The LMS also encourages increased activity in the CRS program. Such work goes toward minimizing the collective impact of flood hazards in Miami-Dade County. As a requirement of participating in the CRS program, each jurisdiction is provided credit for identifying, assessing, and monitoring flood hazard. Miami-Dade County publishes its CRS report every year as an appendage to the LMS document. The report helps to identify progress toward completing flood hazard mitigation projects.

While it is difficult to measure mitigation outcomes, the LMS tracks completed projects through the annually published “Ready, Set, Mitigate Completed Projects of the Local Mitigation Strategy” manual. The completion of these projects and publication of the completed projects manual enables the LMS Coordinator to track and monitor future performance. Performance is also identified during the damage assessment process where damage and opportunities for future mitigation activities are discovered.

Conflict Resolution Procedures

The Miami-Dade County Local Mitigation Strategy Working Group has established procedures to resolve conflicts between member entities that may arise from the development of the LMS as required by the Florida Department of Community Affairs. It has borrowed extensively from the *Regional Dispute Resolution Process of the South Florida Regional Planning Council*.

These procedures are designed to clearly identify and resolve problems as early as possible, to utilize procedures in a low-cost to high-cost sequence, to allow flexibility in which procedures are used, to provide for the appropriate involvement of affected and responsible parties, and to provide as much process certainty as possible.

There are two basic components: process initiation and settlement meetings. Additionally, there are five optional components: pre-initiation meeting, situation assessments, mediation, advisory decision-making, and referral to other dispute resolution processes.

The Working Group consists of representatives from Miami-Dade County, its incorporated municipalities, county departments and other participating organizations.

In the event of a dispute, parties named in the Initiation Letter (see below) are automatically allowed to participate. Other jurisdictions, public or private organizations, groups, or individuals must be suggested by a named party and agreed to by a majority of the named parties before inclusion; or recommended for inclusion by a mediator mutually selected by the named parties.

Other jurisdictions, public and private organizations, groups, or individuals seeking to become named parties can submit a written petition to the Working Group. Such groups will become named parties if agreed to by a majority of the named parties or by a mutually selected mediator. Named parties have twenty-one days to respond to the Initiation Letter.

Each named party must appoint a representative who should have authority to act. Jurisdictions are encouraged to designate a representative before one is needed. This person will be responsible for the party's interests and maintain communication throughout the process. The representative must be named in writing.

- Pre-Initiation Meeting: Any jurisdiction, organization, group or individual may request an informal pre-initiation meeting with the Working Group coordinator.

- Initiation Letter: The conflict resolution process begins with an Initiation Letter from a jurisdiction's governing body, which is sent to all named parties and the Working Group coordinator. This must be accompanied by either a resolution or written authorization from the same governing body.

  The Initiation Letter must identify the issues to be discussed; named parties to be involved; name of the initiating party's representative; others who will attend; and a brief history of the dispute that indicates why this dispute is appropriate for this process.

- Response Letter: The named parties must send a response letter to the Working Group coordinator and all other named parties. The response letter must indicate the respondent's willingness to participate in a settlement meeting and include any

additional issues for discussion as well as a brief description and history of the dispute from the respondent's point of view.

- Situation Assessment: At the request of a jurisdiction, organization, group, or individual, the Working Group coordinator or other neutral party can perform a situation assessment at any time, before or after initiation of the process. The situation assessment can involve examination of documents, interviews and assessment meetings, and can result in a recommendation concerning the issues to be addressed, parties that may participate, appropriate dispute resolution procedures, and a proposed schedule.

Private interests may ask any member of the Working Group to initiate the process. Any public or private organization, group, or individual may request that the Working Group recommend use of the process. The Working Group can recommend that a potential dispute is suitable for the process and transmit its recommendation to the potential parties.

All requests must be in writing and provide all required information. A Working Group representative must respond after reviewing the petitioner's request; meeting with the requesting organization, group, or individual; and performing a situation assessment. If the Working Group representative agrees with this process, a recommendation will be sent to the potential parties.

- Settlement Meetings: At a minimum, the representatives of the named parties must attend the first settlement meeting. This meeting may be facilitated by a member of the Working Group or a mutually agreed upon neutral facilitator. At the initial settlement meeting the named parties must consider adding named parties; consider guidelines for participation; identify the issues to be addressed; explore options for a solution; and seek agreement.

  If the settlement meeting is not held or it produces no agreement to proceed with mediation or advisory decision making, then the participating parties may formally withdraw from the process or proceed to a joint meeting of the governing bodies (as in Florida Statute 164); litigation; administrative hearing; or arbitration.

- Mediation: If two or more named parties submit a request for mediation to the Working Group, then a representative of the Working Group will assist them in selecting and retaining a mediator. Alternatively, the named parties may request that the Working Group coordinator make the selection or request similar assistance from the South Florida Regional Planning Council.

  A mediator who understands hazard mitigation issues and is acceptable to the named parties shall mediate all disputes. Mediators shall be guided by the Standards of Professional Conduct, Florida Rules for Certified and Court Appointed Mediators, Rules 10.020-10.150 F.A.C.

- Advisory Decision Making: If two or more named parties submit a request for advisory decision making to the Working Group, then a representative of the Working Group will assist in selecting and retaining an appropriate neutral. Alternatively, the named parties may request that the Working Group coordinator make the selection. A neutral party that understands hazard mitigation issues and is acceptable to the named parties shall handle all disputes.

Initial settlement meetings are scheduled and held within thirty days of receipt of the initiation letter. Additional settlement meetings, mediation, or advisory decision-making must be completed within forty-five days of the date of the conclusion of the initial settlement meeting.

Timeframes may be altered by mutual agreement of the named parties. The optional components of this process may be used in any order.

In the early stages of the process, the parties should address deferring or seeking stays of judicial or administrative proceedings while using this process.

The form of all agreements shall be determined by the named parties and may include: inter-local agreements; concurrent resolutions; memoranda of understanding; contracts; plan amendments; deed restrictions; or other forms as appropriate.

Agreements signed by the party's representative may be in the form of a recommendation to a formal body and subject to its formal approval.

Two or more parties may reach agreements even if all of the named parties don't agree or don't sign a formal agreement.

After settlement meetings, mediation, or advisory decision-making, the named parties must submit a joint report to the Working Group. The report must contain any statements that any of the named parties wants included as well as:

- An identification of the issues discussed;
- A list of potentially affected or involved jurisdictions, public or private organizations, groups, or individuals (even those who are not named parties);
- A timeframe for starting and ending informal negotiations, additional settlement meetings, mediation, advisory decision making, joint meetings of elected bodies, administrative hearings or litigation;
- Any additional assistance required;
- A cost allocation agreement; and

- A description of responsibilities and schedules for implementing and enforcing agreements reached.

Appropriate opportunities for public input should be considered during the process. Applicable public notices and public records requirements must be observed (Chapters 119 and 120, F.S.).

The participants agree to make every effort to keep costs at a minimum. All costs are to be shared equally among the parties unless otherwise agreed upon or as recommended by a mediator mutually selected by the parties.

To the extent possible, the confidentiality provisions of Chapter 44, F.S. will govern mediation under this process. By participating in this process, participants agree not to offer any comments, meeting records, or written or verbal settlement offers as evidence in subsequent judicial or administrative action.

Hazard Identification & Vulnerability Assessment

As was touched upon in the introduction to the LMS, metropolitan Miami-Dade County is a large and diverse place and therefore vulnerable to many hazards. These hazards include natural, technological, and societal. Each of these types of hazards is unique and produces distinct impacts to a community. Miami-Dade County developed a **Threat Hazard Identification Risk Analysis** (THIRA) in 2011 to provide an overview of all hazards within Miami-Dade County. To minimize replication of information the LMS plan will defer to the THIRA (see **Appendix E** for Sections VI (Hazard Assessment and Consequence Analysis) and Section VI (Risk Assessment Summary). In 2013, The LMS Steering Committee will begin linking potential mitigation actions for the identified hazards as appropriate and applicable.

The following section is the synopsis from *Section VII, Risk Assessment Summary of the 2011* THIRA that illustrates the probability, consequence and overall risk score of natural, technological, criminal/terrorism and public health hazards.

NATURAL HAZARDS

Probability		Consequence							
Hazards	Frequency & Probability	Potential Magnitude & Scale	Impact Analysis			Capabilities & Capacity	Mitigation	Hazard Consequence & Impact Score	OVERALL RISK SCORE
			Social Vulnerabilities Hazard Impact Rating	Physical Vulnerabilities Hazard Impact Rating	Community Conditions Impact Rating				
Natural Hazards									
Droughts	38%	38%	29%	15%	39%	82%	70%	40%	39%
Extreme Cold	17%	11%	29%	15%	34%	82%	67%	32%	23%
Extreme Heat	75%	16%	41%	15%	34%	82%	58%	36%	52%
Flooding	50%	27%	53%	38%	52%	68%	96%	53%	51%
Hailstorms	69%	18%	29%	24%	51%	82%	50%	41%	53%
Heavy Rain	50%	9%	29%	32%	32%	68%	96%	36%	42%
Hurricanes & Tropical Storms	69%	64%	66%	58%	64%	63%	58%	75%	72%
Lightning	75%	18%	29%	15%	29%	82%	96%	32%	49%
Winter Weather / Ice	5%	16%	37%	15%	35%	82%	75%	35%	13%
Sinkholes / Erosion	50%	13%	29%	38%	41%	82%	50%	41%	45%
Space	1%	7%	29%	23%	29%	68%	N/A	29%	5%
Tornadoes	44%	20%	53%	42%	53%	68%	75%	53%	48%
Tsunami	13%	24%	37%	24%	36%	68%	25%	45%	24%
Volcano (Ash)	1%	4%	37%	15%	32%	85%	N/A	28%	5%

Probability		Consequence							
Hazards	Frequency & Probability	Potential Magnitude & Scale	Impact Analysis			Capabilities & Capacity	Mitigation	Hazard Consequence & Impact Score	OVERALL RISK SCORE
			Social Vulnerabilities Hazard Impact Rating	Physical Vulnerabilities Hazard Impact Rating	Community Conditions Impact Rating				
Natural Hazards									
Windstorm	50%	18%	37%	42%	45%	82%	75%	45%	47%
Wildfires	38%	13%	57%	42%	51%	68%	63%	53%	44%
Earthquakes	5%	4%	29%	24%	29%	68%	N/A	29%	12%

KEY:

Frequency	Consequence	Capability/Mitigation	Overall Risk
Not Probable/Frequent	Minimal Impact	Very Capable/Adequate	Low Risk
Somewhat Probable/Frequent	Moderately Low Impact	Capable/Adequate	Moderately Low Risk
Probable/Frequent	Moderately High Impact	Somewhat Capable/ Adequate	Moderately High Risk
Very Probable/Frequent	High Impact	Not Capable or Adequate	High Risk

TECHNOLOGICAL HAZARDS

Probability		Consequence							
Hazards	Frequency & Probability	Potential Magnitude & Scale	Impact Analysis			Capabilities & Capacity	Mitigation	Hazard Consequence & Impact Score	OVERALL RISK SCORE
			Social Vulnerabilities Hazard Impact Rating	Physical Vulnerabilities Hazard Impact Rating	Community Conditions Impact Rating				
Technological Hazards									
Dam/Levee Failure	6%	16%	29%	15%	40%	63%	46%	38%	15%
Electric Utility Failure	75%	13%	29%	23%	35%	65%	67%	37%	53%
Hazardous Materials Release	50%	13%	53%	24%	40%	55%	50%	47%	48%
Mass Migration	25%	0%	37%	15%	35%	55%	38%	37%	30%
Nuclear Power Plant Incident	19%	17%	53%	38%	58%	54%	81%	55%	32%
Structural Fires	50%	17%	45%	30%	35%	82%	83%	41%	45%
Transportation Incident	75%	28%	29%	23%	31%	86%	83%	37%	52%
Water/Wastewater Incident	19%	6%	37%	23%	34%	68%	81%	36%	26%

KEY:

Frequency	Consequence	Capability/Mitigation	Overall Risk
Not Probable/Frequent	Minimal Impact	Very Capable/Adequate	Low Risk
Somewhat Probable/Frequent	Moderately Low Impact	Capable/Adequate	Moderately Low Risk
Probable/Frequent	Moderately High Impact	Somewhat Capable/ Adequate	Moderately High Risk
Very Probable/Frequent	High Impact	Not Capable or Adequate	High Risk

CRIMINAL/TERRORISM HAZARDS

Probability		Consequence							
Hazards	Frequency & Probability	Potential Magnitude & Scale	Impact Analysis: Social Vulnerabilities Hazard Impact Rating	Impact Analysis: Physical Vulnerabilities Hazard Impact Rating	Impact Analysis: Community Conditions Impact Rating	Capabilities & Capacity	Mitigation	Hazard Consequence & Impact Score	OVERALL RISK SCORE
Criminal/Terrorism Hazards									
Civil Unrest	25%	6%	37%	21%	43%	65%	75%	38%	31%
Cyber Security Incident	38%	2%	29%	30%	39%	68%	75%	36%	37%
Terrorism	19%	46%	53%	47%	58%	55%	54%	65%	35%
Bomb Threat	56%	0%	29%	30%	32%	78%	63%	33%	43%

KEY:

Frequency	Consequence	Capability/Mitigation	Overall Risk
Not Probable/Frequent	Minimal Impact	Very Capable/Adequate	Low Risk
Somewhat Probable/Frequent	Moderately Low Impact	Capable/Adequate	Moderately Low Risk
Probable/Frequent	Moderately High Impact	Somewhat Capable/ Adequate	Moderately High Risk
Very Probable/Frequent	High Impact	Not Capable or Adequate	High Risk

PUBLIC HEALTH HAZARDS

Probability		Consequence							
Hazards	Frequency & Probability	Potential Magnitude & Scale	Impact Analysis			Capabilities & Capacity	Mitigation	Hazard Consequence & Impact Score	OVERALL RISK SCORE
			Social Vulnerabilities Hazard Impact Rating	Physical Vulnerabilities Hazard Impact Rating	Community Conditions Impact Rating				
Public Health Hazards									
Anthrax	19%	13%	29%	21%	42%	61%	50%	39%	27%
Animal / Plant Disease Outbreak	13%	3%	29%	21%	35%	71%	N/A	29%	19%
Food Borne Illness	38%	6%	37%	15%	29%	72%	63%	33%	35%
Meningitis	44%	0%	37%	21%	35%	77%	63%	34%	38%
Pandemic / Epidemic	6%	36%	68%	30%	43%	55%	75%	57%	19%
Plague	6%	13%	68%	23%	41%	65%	75%	48%	17%
Water Contamination	25%	10%	45%	23%	34%	73%	67%	39%	31%

KEY:

Frequency	Consequence	Capability/Mitigation	Overall Risk
Not Probable/Frequent	Minimal Impact	Very Capable/Adequate	Low Risk
Somewhat Probable/Frequent	Moderately Low Impact	Capable/Adequate	Moderately Low Risk
Probable/Frequent	Moderately High Impact	Somewhat Capable/ Adequate	Moderately High Risk
Very Probable/Frequent	High Impact	Not Capable or Adequate	High Risk

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Natural Hazards

There are several natural hazards that have historically impacted Miami-Dade County; namely, wind, flooding, excessive temperatures, agricultural hazards, drought and fires. The hazard of wind is generally defined by a grouping of events such as tornadoes, hurricanes, and thunderstorms. A flood is generally defined by inundation that can arise from a variety of water events. The other natural hazards discussed in this section are excessive temperatures, which are defined by both extreme cold or extreme heat conditions; agricultural hazards, which are those elements that impact crops; drought – the lack of precipitation, fire, and epidemic diseases. Any one of the hazards listed above can severely impact the residents of the county by causing physical harm or death, destroying or damaging structures of various types and vegetation; thereby, also impacting the economy. The maps included in the Appendices summarize the vulnerable areas of those hazards whose impact is limited to a specific geographic area.

The county is interspersed with various high value structures including hospitals, schools, police and fire stations, government administrative buildings, commercial facilities, etc. These structures are vulnerable to the hazards listed above, especially, wind, flood, and fires. The geography of the county is such that any one of these hazards can impact various types of structures. Mitigation efforts throughout the years have lessened the county's vulnerability to these hazards. However, more work is required to continue mitigation efforts to ensure the county's resistance to hazards.

Wind

The entire population of Miami-Dade County, some 2.4 million people, resides within twenty miles of the coast with no hills to buffer the wind. Some have remarked that Hurricane Andrew did no damage beyond twenty miles inland; but that's because there is nothing beyond twenty miles inland except the Everglades. And so, everybody and everything in Miami-Dade County are vulnerable to the hazards of windstorm events. The Saffir-Simpson and Fujita scales are included in **Appendix E** to illustrate the extent of wind that can impact the county.

What We Know Now

Unlike other natural hazards, windstorm events such as hurricanes, tornadoes and severe thunderstorms don't sneak up on us the way they used to. Modern technology provides a warning. For thunderstorms and tornados we have as much as an hour or more notice that conditions are favorable for an occurrence. That's not much time, but it's a warning. With hurricanes, we know days and even weeks in advance that one is on the way. So, here's this hurricane out there; it's dangerous, deadly, and it's on the way; it may come here and, there is nothing that we can do to stop it. We can't stop it but the LMS Working Group has developed a number of

measures to mitigate against the full force of hurricanes and other windstorms, which have been identified in the "Projects" section of this document.

What to Do About It

Arguably, the best way to prevent damage from severe windstorms is to build stronger structures to withstand them. Miami-Dade County prides itself by having established the nation's, if not the world's, toughest building codes. Everywhere one goes one sees construction material vendors pointing out that they have received the Miami-Dade County "product approval." As noted earlier, the Miami-Dade Building Code Compliance Office received a national mitigation award for their fight to retain the tough codes during the process of developing a single statewide *Florida Building Code*. The new code contains a section called the HVHZ – the High Velocity Hurricane Zone – that applies principally to Miami-Dade and Broward counties. This new code also mandates window protection on all new construction and any repair of substantial damage.

That new code now requires window protection for new construction, but what about the buildings already standing. The LMS Working Group sponsors several mitigation programs to retrofit these structures with shutters as well as other windstorm mitigation measures such as adding additional hurricane straps to the roof and strengthening entry doors. Our residential shuttering program installs shutters on the homes of low-income citizens. Our institutional shuttering program installs window protection on buildings owned by municipal, county and other eligible organizations. We have also retrofitted many public schools to protect the building and to serve as hurricane evacuation centers.

Storm Surge

Another condition that usually accompanies a hurricane and is a product of wind is Storm Surge**,** that dome of water that comes ashore with a hurricane. Using the SLOSH II computer model from FEMA and the National Weather Service along with historical data, those areas in the county that are vulnerable to damage from storm surge have been noted and the evacuation areas found in **Appendix F** of this document are based on this information. **Appendix F** also contains a storm surge map showing the extent of impact of a category 5 hurricane on the Saffir-Simpson scale. Storm surge impacts the community in many ways. Coastal erosion may occur as a result of storm surge. Flooding, which is discussed in detail below also occurs due to storm surge. Such occurrences are apparent when the wind-driven water has inundated roads, drainage and sewerage facilities, vegetation, and homes. In addition to these impacts, flooding from storm surge precipitates evacuations along the coast of Miami-Dade County as illustrated in the map of evacuation areas referenced above. Consequently, flooding, which is discussed below, is a function of storm surge.

Flooding

Background and History

During the early stages of development in Miami-Dade County, the land was frequently inundated for long periods due to the flat topography, low land elevations and the high groundwater table in the Biscayne aquifer. To remedy this situation, and to make the land suitable for habitation, various local governments and private entities initiated the construction of the canal system that exists today. This system was designed to remove water to the east and ultimately to Biscayne Bay using gravity flow. However, the excavation of the canal system exposed the Biscayne aquifer, the county's primary source of drinking water, to saltwater intrusion. In order to stem the flow of salt water into the Biscayne aquifer, salinity control structures were constructed at the mouths of both primary and secondary canals throughout Miami-Dade County.

In addition, the early design of the canal system did not consider additional development in the western parts of the county. These western areas are lower in elevation, and thus more flood-prone. Therefore, drainage from these areas is dependent on the areas to the east being drained, and thereby making room in the canals to drain the western areas.

Due to the unexpected development in the western areas and the general increase in population and development throughout the county, the primary canal system has exceeded its design capacity for drainage. The system relies on gravity to discharge, and is inadequate to remove storm water volume caused by major rain events, particularly considering large tidal surge that may accompany tropical storm events.

Today, the canal system in Miami-Dade County consists of over 616 miles laid out in approximate one to two-mile grids. The canal system is divided into 360 miles of primary canals and 260 miles of smaller secondary canals. The primary system, including most of the salinity control structures, is operated by the South Florida Water Management District. The secondary system is the responsibility of Miami-Dade County. In general, the secondary canal system connects into the primary system, which empties into Biscayne Bay. The ability to move water in the secondary system is dependent on the available capacity of the primary system, which, in turn, is dependent in part on the proper operation of the salinity control structures.

The principal functions of the canal system are:

1. To maintain adequate groundwater levels in the Biscayne aquifer, to provide for both water supply and to prevent salt-water intrusion. In general, the canal system recharges the Biscayne aquifer during the dry season when flow is conveyed from Lake Okeechobee and the water conservation areas into the urban-

ized areas. Conversely, during the wet season, groundwater flows from the aquifer into the canals and is discharged to the ocean, as needed, to prevent flooding.

2. To provide for drainage during periods of excess rainfall, when the control structures must be operated to prevent overtopping of canal banks.

Recent Flood Events

Two recent flood events changed the way water managers, emergency managers and residents approached disasters in south Florida. Prior to Hurricane Irene, the focus had been on hurricanes as potential wind hazards, and not particularly flood events.

In October 1999, Hurricane Irene (DR-1306) developed and started a path towards south Florida. Initial projections were correct in stating the hurricane would impact the west coast of Florida, and Irene traveled through the state and, on October 15, passed just to the west of Miami-Dade County.

Although the hurricane did not pass directly through the county and no exceptionally high winds were experienced, the heavy rainfall associated with this storm did hit Miami-Dade County, and the impacts were severe. Some roads were impassible for weeks, electricity was out in certain areas, and residents and businesses suffered heavy losses.

As a result of Hurricane Irene, the Miami-Dade County Board of County Commissioners created a Flood Management Task Force, to analyze why certain areas were so heavily impacted by floodwaters. After eight months of meetings with affected residents and industry, the Task Force offered eighteen recommendations. These recommendations are being implemented where possible, and progress is being tracked.

On October 3, 2000, a low-pressure system, later to become Tropical Storm Leslie, developed off the west coast of Cuba, and headed toward South Florida (DR-1345). Water managers and weather officials closely tracked the storm, and preemptive measures were taken to start moving water out of the canals.

However, weather forecasts called for 4-8 inches of rainfall from this storm, and unfortunately, once the storm passed over south Florida, it exploded, dumping 14 to18 inches of rainfall over a linear area in the center of the county. Equally as unfortunate were residents and businesses that experienced a similar result as in Irene.

Immediately after this so-called "no-name" storm hit, the county commission reconvened the Task Force, to re-examine the problem. This Task Force recently released an updated report that includes additional data concerning the flood events.

Hurricane Katrina in August, 2005 was every bit as much a flood event as it was a windstorm. Large areas in south Miami-Dade County were impacted by flooding, especially in the agricultural community.

Where Are We Now?

Because Miami-Dade County is located in a unique low-lying area, it is particularly susceptible to flooding from major rain events and storm surge. The county is surrounded by and interspersed with canals, lakes, rivers, the everglades, the Atlantic Ocean and Biscayne Bay. Miami-Dade County lies close to sea level, and its water supply lies just below the surface of the ground. Major rain events sometimes leave rainwater nowhere to drain, causing flooding in parts of the county.

Total structures last counted in the unincorporated area of Miami-Dade County consist of 112,600 structures in Special Flood Hazard Areas, and 132,400 in X and X-500 zones. Due to the variety of factors such as storm paths, intensity and duration, the low-lying topography of the total area, and seasonal variations in groundwater elevations, any number of structures from a few to the total numbers stated above could be impacted from the flood hazard. The impact of floods could range anywhere from wet carpet or floors to damaged interiors leading to destruction of property. In addition, floods can potentially cause damage to infrastructure, such as washing out roads and bridges, or standing water inhibiting movement of vehicular or train traffic. Furthermore, floods also impact the agricultural community due to crops being inundated over an extended time or being washed away. Flooding, whether in rural or urban areas, can last up to several weeks as was the case during hurricane Irene. Most of the county except for Bay Harbor Islands, Indian Creek Village, Miami Lakes, and North Bay Village are susceptible to flooding. The map in **Appendix F** displays the flood zone designations in the count and there is an interactive website where an area or address can be queried for more specific flood zone information: http://gisweb.miamidade.gov/floodzone/ . The types of flood hazards that have potential to occur are listed below.

Coastal Flooding

Coastal flooding has potential to impact residential and commercial development along the east coast of South Florida and Biscayne Bay, primarily through storm surge and inundation by a hurricane or tropical rain event occurring in the Atlantic Ocean. Although these impacts have potential to occur from a storm with a path from west to east, this type of impact would be rare.

The county's coastline consists of mainly residential development, and county and state parks. Dune lines and some mangrove fringes do exist over part of these geographical areas.

Hurricanes

Hurricanes have potential to impact all areas of Miami-Dade County, depending upon their origin, makeup and path. As demonstrated above, hurricanes have heavily impacted county residents, without displaying heavy winds or structural damage, as earlier, more powerful storms (Andrew, 1992) have displayed. Weather forecasters and emergency managers now have to look at a hurricane's potential for flooding, and not just structural damage, when a storm is impending.

Tropical Weather

Due to the impacts of the storm of October 2000, all tropical weather systems have to be carefully monitored, several days before they make landfall. Because of the time needed to move water through canals to increase capacity, more advanced monitoring is needed.

Inland Flooding

Both Hurricane Irene and Tropical Storm Leslie traveled through the interior of the state, and affected inland areas. Canal and groundwater elevations, when combined with seasonal rainfall variations and the volume of the potential storm, result in a definite flood hazard to inland areas.

Elevations of Pre-FIRM Structures

Pre-FIRM structures represent a potential flood hazard, in that, due to the relatively flat terrain, older structures built lower will experience more of a hazard than structures built to FIRM elevations. In fact, because newer structures may be sited close to the pre-FIRM buildings, their potential risk for flood damage may be even greater.

Excessive Temperatures

Windstorm and floods are our major hazard events but not by any means the only hazards to threaten south Florida and Miami-Dade County. Mother Nature does things to us other than hurricanes and floods. The county is also vulnerable to excessive temperatures, which are discussed below.

All of Miami-Dade County is vulnerable to weather that produces extreme heat or cold. With regard to heat, Miami-Dade County has a large elderly population that is especially susceptible to the effects of extreme heat. One of the mitigation methods used is to open air-conditioned shelters during the hottest times of day. The effects of extreme heat could range from small scale dehydration to heat cramps, heat exhaustion and heat stroke potentially leading to death in cases that are not treated. The risks associated with heat are a concern when one is exposed to temperatures of 80 degrees Fahrenheit or higher, with increased risks at higher temperatures. On

average, summer temperatures reach 80 degrees Fahrenheit or greater at least 4 months per year (statistics since 1953 – National Climatic Data Center). More information regarding the impacts of heat is available in Appendix C.

As with extreme heat events, cold weather also impacts the human population within the county. Those individuals that are most vulnerable to cold weather are the indigent population who usually do not have adequate shelter to keep themselves warm. Miami-Dade County mitigates the impacts of cold weather events by opening shelters for those individuals most vulnerable to this hazard. The threshold for opening cold weather shelters is when temperatures reach 50 degrees Fahrenheit or below. Current data available shows that the number of times temperatures fall below 50 degrees Fahrenheit is insignificant to record when looking at average monthly temperatures; however, as illustrated in January 2010, such temperatures are experienced in the county. However, a look at individual days will show Most of the county's agricultural community is located within the southern parts of the county. Since agriculture is second only to tourism in the economy of South Florida, Cold weather events have a devastating impact on the community. In February of 2001, Miami-Dade County was granted a major disaster declaration – FEMA-1359-DR-FL – because of severe freezing. The extent of damage caused by excessive heat includes loss of life in humans, and loss of entire crop in agriculture.

Agricultural Hazards

As it was mentioned above, agriculture is an important element of the county's economy. Historically, Miami-Dade has been impacted by the Mediterranean Fruit Fly, citrus canker and now the pink hibiscus mealy bug, all of which can cause – have caused – as much damage as any storm could. Infestations of this nature primarily impact the agriculture community in the City of Homestead; however, any plant within the county which is susceptible to these insects is vulnerable. Therefore, agricultural hazards threaten all of Miami-Dade County and can potentially eliminate entire segments of this sector.

The Miami-Dade County Agriculture Extension reports that there is an average of one established new pest a month within the county. In addition, freezes, droughts, fires, and flooding also affect the agricultural industry. The Miami-Dade LMS Working Group has an agricultural committee, composed of interested members and is established to address and mitigate the various problems of the agriculture community. For the most part, mitigation against agricultural hazards is most successful when the agricultural community is educated as to how to limit losses. To that end, the County Agriculture Extension is the best resource for educating the agriculture community in mitigating hazard impacts in the county. Losses in the agricultural community have numbered in the hundreds of millions of dollars in recent years. These losses are not only from crop damage but also include loss of irrigation systems, damage or destruction to greenhouses and other growing facilities and loss of transportation equipment. Due to the seasonal nature of the agriculture industry,

disruptions that occur be it through freezes, severe drought, infestations, fires, and flooding may lead to job losses for seasonal workers and loss of the entire crop.

Drought

In addition to its impact on farming, as noted above, severe drought has many other dynamic effects on our community and can occur anywhere in the county. Water shortages have been acute in recent years causing annoyances such as curtailed lawn watering and car washing, but also major threats to our drinking water supply by allowing salt water intrusion into the ground water. The extent of drought conditions is referenced according to the Palmer Drought Severity Index (PDSI), which is included in Appendix C. In the last half-century, Miami-Dade County has experienced the full range of drought as indicated by the PDSI the severest being 4.25 in 1989. The LMS flood committee addresses the impact of not enough water as well as the issue of too much. In addition, the South Florida Water Management District has lead responsibilities for mitigating against the impacts of droughts.

Wildfires

While Miami-Dade County does not have vast forests that can catch fire, we do have considerable natural areas that are subject to wildfires (See map in Appendix E). The greatest concern exists in the northwest and south of the county (See map in Appendix E), a land mass greater than 700 square miles.

The Miami-Dade Park & Recreation Department oversees undeveloped natural areas and the Miami-Dade Department of Environment Resources Management oversees the EEL or Environmentally Endangered Lands program. Also, over one third of this county falls within Everglades National Park that has huge areas vulnerable to wildfire. The major harm from wildfires in Miami-Dade County is not so much from the fires themselves but from ensuing smoke that drifts into the urban areas. This can be extremely dangerous to the very young, the elderly and those with respiratory problems. Therefore, the extent of impact from wildfires could be a complete burn of the Everglades causing respiratory complications to the vulnerable populations listed above. The LMS Working Group has a wildfire committee made up of interested parties such as the National Park Service, Florida Division of Forestry, Miami-Dade Fire Rescue and several others. The prime interest of the committee is to promote controlled or prescribed burns, which removes the fuel load and dramatically reduces the chance of a wildfire.

Epidemic Diseases

While epidemic diseases are certainly a threat to Miami-Dade County and its citizens, mitigating factors are under the control of the federal government through the Centers for Disease Control and Prevention, the Food and Drug Administration and other agencies. The consequences of an epidemic disease outbreak would be se-

vere and would potentially cause mass fatalities and illness within the county. This threat is not one that can be easily mitigated through the Local Mitigation Strategy.

Technological Hazards

Mother Nature isn't the only villain causing hazards in the county; people keep causing hazards, too.

A bleach factory. A plating plant. A tire warehouse. A propane distributor. A cold storage facility. Plus, chemicals in trucks and chemicals in rail cars continuously passing through. What do they all have in common? Hazardous materials in abundance in our county that must be dealt with to protect our citizens. Miami-Dade County, the city of Miami and the city of Hialeah fire rescue departments each maintains a hazardous materials response (HazMat) team. MDEM routinely holds training classes in various HazMat subjects. Additionally, the locations of all HazMat sites as defined by Section 302 of the Federal Emergency Planning and Community Right-to-Know Act are contained in the Local Mitigation Strategy critical facilities inventory as well as documentation on the facilities mentioned above. Due to the road network in the county and the various facilities that store hazardous materials within, HazMat incidents may be localized or widespread. As a result, the entire county is vulnerable to the consequences of a hazardous materials incident.

Nuclear Power Plant

Miami-Dade County is the home of Florida Power & Light's Turkey Point nuclear power plant and all the possible mishaps that may occur. MDEM and FPL have developed complete evacuation plans and other consequence management procedures to deal with problems at the plant. While the risk of disaster from a nuclear plant accident is very low, practice drills and exercises to maintain readiness in the rare event of an accident are constantly carried out. Furthermore, FPL is an active member of the LMS Working Group and continuously contributes to our mitigation measures. **Appendix F** contains a map of the Turkey Point Power Plant 10-Mile EPZ (Emergency Planning Zone) and the land uses therein.

Transportation Accidents

Miami International Airport is one of the busiest airports in the world in both passengers carried and in the air cargo arena. The Port of Miami is the world's leading cruise port and is also one of the busiest container ports on the eastern seaboard. Furthermore, the Miami River is the fifth busiest port in the state of Florida. Our railroads are Amtrak, CSX, Florida East Coast Railroad and TriRail plus our own Metrorail and Metromover systems. The southern terminus for the Florida Turnpike, I-75 and I-95 are all in Miami-Dade County. There are twenty-three drawbridges in the county – twenty-one automobile and two railroads – that could cause major in-

terruptions if a malfunction should occur. So what does this all means in the way of hazard events? In recent years Value Jet, FineAir and Chalk's Ocean aircraft all crashed in Miami-Dade County. Carnival Cruise Lines' MS Ecstasy caught fire as it departed the port and Norwegian Cruise Lines' SS Norway experienced a boiler explosion while in port. Between 1995 and 2000 there were 53 train accidents within the county borders. And, of course, the too-many-to-count traffic accidents on our major roadways. The consequences of transportation accidents range from a traffic nuisance to a major event of national significance. Suffice it to say, there is much to mitigate and this area is one of our countywide initiatives that may be found in Part II of this document.

Societal Hazards

The citizens of this county are a unique blend from many cultures with many languages and ethnic backgrounds and because of this conflicts are sure to occur. Societal hazards tend to impact the social, economic, healthcare, and public safety elements of communities. For example, a mass migration event would potentially create a strain on the economy as there would be a greater demand for the services that are provided by government. The potential for cheaper labor from other countries may reduce the wages employers are willing to pay. In addition, a mass migration event may introduce diseases that are not common to the county thus requiring a coordinated response from healthcare providers to ensure the containment of disease outbreaks. In a similar way, terrorism and/or riots and demonstrations also cause a burden on public safety and healthcare services in a community due to the need for safeguarding the populace and providing an appropriate medical response. Societal hazards of concern in the county include:

Mass Migration

We have continuous mass migration situations in Miami-Dade County from the Mariel boatlift in 1980 to the constant stream of Cuban rafters to boatloads of Haitian refugees that must be addressed. Miami-Dade Department of Emergency Management addresses this mass migration issue in a portion of a plan called the "Caribbean Mass Migration" annex to the Comprehensive Emergency Management Plan. This plan brings together federal, state and local agencies that have the responsibility to deal with the subject.

Change in Cuban Government

To most of the United States, a change in the government of Cuba is inconsequential. However, this is not true of Miami-Dade County with its large Cuban refugee population. In 2006, for the first time, the Miami-Dade County Emergency Operations Center was activated when Fidel Castro turned over the reins of government to his brother Raul.

Riots and Demonstrations

Unfortunately, Miami-Dade has experienced too many riots and demonstrations over the years for various reasons such as racial incidents (McDuffie, etc.) or cultural conflict (the Latin Grammies), not to mention the many issues that surfaced during the Elián Gonzalez affair.

Terrorism

Terrorism is not new to Miami-Dade County. During the 1960s there were numerous bombings in this community attributed to radical Cuban groups opposed to any persons or organizations that espoused moderation toward Fidel Castro and his regime. It's believed by many that South Florida is a favored place for Middle East terrorists to hide and scheme. The LMS Working Group has established a terrorism mitigation committee to study and develop counter terrorism measures. The committee has already determined that one excellent measure is to develop a curriculum to help school children understand and cope with future terrorism. Additionally, the Miami-Dade County Domestic Preparedness Strategy (DPS), which includes homeland security and terrorism mitigation measures, is, by reference, included in the Local Mitigation Strategy.

Data Sources Identified

We have identified the following data sources as being important and comprehensive to the accomplishment of our mitigation goals. However, additional data sources will surely be discovered as we proceed with the task of mitigation.

Federal Emergency Management Agency (FEMA)

- National Flood Insurance Program repetitive loss inventory. This has been updated during 2005 and in 2007 to include every repetitive loss property in Miami-Dade County.

- Flood Insurance Rate Maps, hurricane storm surge maps, and previous natural hazard computer modeling results. A FIRM restudy was begun in early 2003 by the FIRM subcommittee of the LMS flood committee to update the county's FIRM maps. This restudy continues in 2007.

- The FEMA website www.fema.gov has a wealth of accumulated data that can be extremely valuable in developing mitigation measures.

Other U. S. Government Databases and Information Sources

- National Hurricane Center and the National Oceanographic Atmospheric Administration (NOAA) historical storm related data (including, National Climatic Data Center).
- The National Weather Service Miami Forecast Office data files.
- National Hurricane Center "SLOSH" models.
- National Priorities List (NPL)
- Comprehensive Environmental Response, Compensation and Liability Information System List (CERCLIS – the "Superfund")
- No Further Remedial Action Planned List (NFRAP)
- Emergency Response Notification System List (ERNS)
- RCRA Corrective Action Tracking System List (CORRACTS)
- Resource Conservation and Recovery Information System List (RCRIS)
- Hazardous Waste Data Management System List (HWDMS)
- Facility Index Data System List (FINDS)
- Toxic Release Inventory System List (TRIS)
- U. S. Immigration and Naturalization Service databases.

State of Florida

- Florida State University Department of Meteorology hurricane historical database.
- State-Funded Action Sites List (SFAS).
- State Sites List (SITES).
- Solid Waste Facilities List (SLDWST).
- Petroleum Contamination Tracking System Report (PCTS).
- Stationary Tank Inventory System List (TANKS).

- Hazardous Waste Compliance & Enforcement Tracking System List (COMHAZ).

- South Florida Water Management District (SFWMD).

Miami-Dade County

- Municipal and County Emergency Management Plans and Comprehensive Plans.

- Municipal and County Floodplain Management Plans.

- Miami-Dade Stormwater Management Master Plan and Capital Improvements Projects.

- Miami-Dade County, Division of Environmental Resources Management (MDERM) GIS database.

- Miami-Dade County, Information Technology Department, Critical Facilities Inventory and other GIS databases.

- Enforcement Case Tracking System Report (ECTS).

- Fuel Spill Report (FSPILL).

- Hazardous Waste Report (HW).

- Industrial Waste Reports.

- Underground Storage Tanks Report (UST).

- Agriculture extension services and databases.

Municipal Agencies

Staff resources, records and data files.

Additional Resources

- The American Red Cross will provide information regarding shelters, as well as staff resources and records.

- Internet web sites provided by the Florida Department of Community Affairs as part of the Local Mitigation Strategy Guidebook.

Private Sector Interests

The first task in this section was to identify private sector interests that would benefit from participation in the LMS process. It is difficult to identify any private sector interest that would not benefit from the LMS process and this is the concept adopted by the Working Group. The method used to accomplish private sector involvement has been to merely ask – which has met with considerable success since the private sector in South Florida also experienced Hurricane Andrew and the other disaster events. By mitigating damages to the private sector we are mitigating against the economic impact of lost jobs, lost inventory and lost quality of life.

Each municipal member of the Working Group has submitted a list of suitable businesses and citizen groups located within each community. The initial private sector members of the Working Group have also made recommendations. Additionally, a business recovery development committee has formed including AT&T, Bank of America, Caterpillar, Greyhound, The Home Depot, IBM, Macy's, Ryder System, Trane, Visa, Wachovia, Wal-Mart and many others to plan for and mitigate business interruption.

Meetings have been held with several private sector groups including hospitals and health service organizations, insurance industry representatives, the banking industry, the cruise lines that are based in the Miami area, engineering firms and VOAD (Volunteer Organizations Active in Disasters). The area's institutes of higher learning have been especially interested in LMS, not only the public schools – Florida Atlantic University, Florida International University, Miami-Dade College and the University of Florida – but the private schools including Barry University, Florida Memorial University, Johnson & Wales University, St. Thomas University and the University of Miami as well. Miami-Dade County Public Schools plus several private schools take part.

Finally, we approached the various chambers of commerce that exist throughout the county and found considerable interest in contributing to the LMS project.

A number of private sector interests are not only active in LMS now but plan to continue as active members of the Working Group especially as we move into the more active phases of the strategy.

Prioritizing Mitigation Initiatives

Once the vulnerability assessment and risk analysis are complete and the hazard mitigation opportunities have been identified, proper priorities must be established concerning each proposed project's impact on life safety, on quality of life, cost effectiveness and value to the overall community including but, by no means limited to, value as compared to other similar projects especially during times of limited funding availability.

Prioritization of countywide projects may be accomplished by the LMS Steering Committee or other "review committee" established by and representing a cross section of the Working Group. The Miami-Dade Office of Emergency Management's LMS Coordinator or his designated representative will act as the committee facilitator. The committee's primary function will be to review and act on recommendations with respect to its evaluation of mitigation initiatives and its ranking of the priorities for their implementation. In a similar manner, each municipality, county department or other organization will prioritize the projects that affect only that jurisdiction and submit to the Steering Committee a complete, prioritized list for inclusion in the LMS.

Miami-Dade Office of Emergency Management will be responsible for soliciting, securing, evaluating, and generally acting as the technical & administrative staff for the management of the prioritization process and for the coordination of the implementation of initiatives selected for priority treatment.

The first step in prioritization is the adoption of a list of potential mitigation initiatives that:

1. Reduce vulnerability;

2. Study and identify cost beneficial mitigation activities, including engineering studies;

3. Identify mitigation initiatives found in existing local government capital improvement plans for future funding consideration;

4. Recommend program and policy actions and revisions to further promote effective hazard mitigation.

5. Adoption of evaluation criteria for the initiatives included in the above list.

The prioritization process has been divided into three parameters: suitability, risk reduction potential and cost. Within each parameter are recommended measures to be considered during prioritization of the project:

- Appropriateness of the measure: How well and effectively does it relate to identified hazards and vulnerability targets and problems? Does the initiative help achieve mitigation goals? How many and, to what extent?

- Community acceptance: Do most communities accept it completely, partially or is it not likely to be accepted by the community at all – the "not-in-my-backyard" situation?

- Environmental impact: Will the initiative have a positive or negative impact on the environment or, perhaps, none at all?

- Legislation: Can the initiative be implemented within existing laws and regulations or will it require action at the legislative or senior management levels? How does it relate to current legislative intents?

- Scope of the benefits: Does the measure benefit the entire county, multiple municipalities, and a limited number of the communities or, perhaps, a single community?

- Potential to save lives: How many lives, if any, will this measure save or protect?

- Importance of benefits: What is the effect of the measure on essential services such as life safety, human health and the basic necessities of life?

- Inconveniences avoided: Will completion of the project cause significant inconvenience to the community (traffic problems, business interruptions, delays, loss of power)? Or, will nuisances be few?

- Economic effects and property damage avoided: What will be the adverse economic effects of the measure? Will there be business losses or property damage?

- Number of people to benefit: Will a large number of people benefit or only a few? Over 100,000? Over 10,000? Less than 10,000?

- Estimated costs: What is the initial cost of the project or measure? Less than $100,000? Less than $1,000,000? Over $1,000,000? And, what will it cost to maintain in the future? High or low maintenance costs?

- Benefit to cost ratio: To what extent do the economic benefits exceed the cost of the initiative using FEMA technical analysis criteria?

- Financing: Are there methods available for financing the cost of the initiative? Does it qualify for available loan and/or grant programs? How well does it relate to the priorities of loan and grant sources? Are matching funds available if required?

- Affordability: Can we afford this? What is the initiative's cost in relation to available resources at county and municipal levels? What is the cost of maintenance and can we afford to maintain it once it's complete?

- Repetitive losses: The facility was damaged at least once. How will this measure affect repetitive losses? Greatly reduced? Somewhat reduced? Unaffected?

- Other issue or factors: What unknown issue may crop up? Is the measure consistent with existing master or emergency plans?

The process itself will follow these steps:

1. The LMS Coordinator will communicate with the various municipalities and other Working Group members at least semi-annually inviting them to submit projects for implementation within the framework of the Local Mitigation Strategy.

2. The LMS Coordinator evaluates the proposals in terms of the above criteria and submits the findings to the review committee.

3. Using the priority matrix (see appendix G), the review committee rates and ranks the countywide initiatives, formalizing those selected, as "Priority Initiatives" and includes them, along with the prioritized project lists from the various other jurisdictions, in Part II, "The Projects" section of the LMS.

4. The final step is for the local municipalities and the review committee to collaborate in the preparation of implementation programs for hazard mitigation initiatives derived from the prioritization process.

The above process provides a context for identifying the most relevant hazard mitigation initiatives. It provides a means to coordinate these initiatives and pool the ability to justify and secure resources on a far more effective basis than if each community were to seek them on its own.

Evaluation Criteria and Procedures to Review and Revise the LMS

As stated in the "Program Continuity and Meetings" section, this document will be updated by the LMS Coordinator with the assistance of the Steering Committee and

input from the LMS Working Group. The majority of revisions made to each section of this document are based upon Working Group meetings where comments are sought from participants. In addition and as also stated in the section identified above, the public is also given an opportunity to review this document and provide comments through the Miami-Dade County website. Revisions may also be made based upon experience from any significant events such as a hurricane, destructive tornado, severe hazardous materials spill or any other occurrence where mitigation could benefit the community. Changes in federal, state, and local laws will also be reflected in the updated version of this document. The revisions will then be distributed to all affected parties by the LMS Coordinator. The sections which are most frequently revised are:

- "Policies Ordinances and Programs Affecting Mitigation;"
- "Data Sources Identified;" and
- "The Projects"

The evaluation criteria which are used include:

1. Have there been any new mandates from federal, state or local agencies that require changes to the Local Mitigation Strategy? Any new or changing laws, policies or regulations?

2. Are there any societal developments or significant changes in the community that must be added to the current LMS? Does the LMS still reflect the concerns of the community? Are the demographics the same? Has there been any growth or development in hazard areas?

3. Have there been any changes in funding sources or requirements?

4. Are there any recent technological developments that should be reviewed for inclusion in the LMS document?

5. Should the LMS be updated to include any new forms of hazards or areas of vulnerability within our community?

6. Have there been any changes in the Comprehensive Plan or any other form of standard operating procedure?

7. Have any of the mitigation opportunities been implemented? Are the priorities for implementation the same?

8. What are the recommendations or lessons learned from any major incidents that have occurred during the past year?

During the revision process, each criterion is addressed to determine if they are still valid and adjustments are made as necessary. When satisfied that the criteria are appropriate, each of the outstanding mitigation opportunities is then compared against the criteria. All existing mitigation opportunities that are determined to still be viable projects will be left standing. All those that are determined to be no longer workable will be set aside for further review and revision or, dropped as no longer feasible.

Miami-Dade County Critical Facilities Inventory

Miami-Dade County and the municipalities therein, along with the many other participants in the Local Mitigation Strategy, received from the Florida Department of Community Affairs maps depicting areas vulnerable to storm surge, inland flooding and wind which were augmented by data provided by the Tropical Prediction Center of the National Weather Service (National Hurricane Center) and statistics gathered based on actual vulnerabilities learned from Hurricane Andrew and other disaster events.

Using data supplied by the municipalities and the various county departments, a database has been developed which includes the critical facilities inventory, NFIP repetitive loss data, historic flood data and the locations of hazardous materials that fall under the jurisdiction of Section 302 of the Federal Emergency Planning and Community Right-to-Know Act. This data has been supplied by the Miami-Dade County Division of Environmental Resources Management (MDERM) and the State Emergency Response Commission.

Flooding in South Florida is virtually always the result of excessive rainfall. Historical flood data has been compiled by MDERM based on flooding by two principal causes, low elevation (the saucer effect) and clogged, damaged or insufficient storm drains. This is augmented by data from the National Weather Service.

Repetitive loss data has been gathered from FEMA and the National Flood Insurance Program through the various city building officials and Community Rating System coordinators. Unfortunately, there are over 2,172 repetitive loss properties in Miami-Dade County. A table of illustrating these losses (not mitigated as identified by FEMA) is available in Appendix F. The repetitive loss data will be maintained by DERM and the municipal building officials separately and will be continuously updated as more information is acquired.

Similarly, Miami-Dade and the municipalities control a huge inventory of properties. Therefore, due to its voluminous size, the listing of non-critical municipal public building and facilities will be maintained separately by the county and each municipality.

A critical facilities inventory is maintained by Miami-Dade Emergency Management (MDEM) and Miami-Dade Information Technology Department (ITD) that includes those facilities that have been deemed critical by the state and federal governments. A copy has been supplied to the Florida Division of Emergency Management as well. The inventory includes GIS coverage for the following: the Miami-Dade County street network, day care centers, medical facilities (MMF, hospitals, nursing homes, adult living facilities), Miami-Dade fire stations, municipal fire stations, Miami-Dade police stations, municipal police stations, solid waste management sites, sewage treatment plants, sewer pump stations, water treatment plants, Miami-Dade County schools, hazardous materials sites, municipal critical facilities inventory, the Miami-Dade evacuation network, and hurricane evacuation centers.

While the state and federal government defines critical facilities as those listed above, the Miami-Dade LMS Working Group has defined critical facilities in three types or levels, which are:

1. Level 1 – A facility that must remain available in all circumstances and at all times. The community cannot do without this facility at all. Protective measures are an absolute must.

2. Level 2 – A facility that must be restored within twenty-four hours or risk dire consequences to the community.

3. Level 3 – A facility that must be restored within seventy-two hours or the community may suffer major problems.

The Working Group concludes that any facility that the community can do without for more than seventy-two hours is not truly critical; important perhaps, but not critical.

These facilities that are important but not critical include such venues as sports arenas, shopping malls, governmental buildings, churches, general service hospitals, etc. It also includes facilities with a social importance to certain groups such as the Freedom Tower to the Cuban community and the Holocaust Memorial to the Jewish community. A listing of important facilities is also kept in inventory and this inventory is available to those so authorized.

For further information please contact:

Cathie Perkins
LMS Coordinator
9300 NW 41st Street
Miami, FL 33178
(305) 468-5400
Cathie.perkins@miamidade.gov
mdlms@miamidade.gov

website: http://www.miamidade.gov/fire/mitigation.asp

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