SECTION VI
IMPLEMENTATION OF MITIGATION MEASURES

A. POTENTIAL MITIGATION INITIATIVES

Previous sections of this report have attempted to identify the potential risks associated with hazards that are most likely to occur in the community. This next step is to identify mitigation initiatives that would reduce the community's vulnerability to these risks. This section outlines several mitigation strategies that can be pursued to address the identified risks.

The strategies identified in this section were reviewed by all City and County departments, the Local Hazard Mitigation Working Group and other public and private entities that may be affected by their implementation.

Hillsborough County and the municipalities are involved in creating, implementing, and participating in various programs that work towards achieving the goal and objectives identified as the LMS Guiding Principles. To further the understanding of specific hazards and their associated mitigation initiatives/actions, a brief description follows in alphabetical order.

1. **Assessments**
   Planning tools and techniques are used to reduce the threat of damage and disasters. Mitigation actions need to be reviewed from both a planning and an operational perspective. Initiatives and processes will need to be evaluated and possibly redesigned according to these assessments. Long-term redevelopment can better direct resources to meet mitigation objectives such as acquiring lands with repetitive flood losses for use as drainage basins, greenways, or parks.

2. **Canals and Waterways**
   Rivers, canals and other waterways are important components to the Bay area's economic and ecological environments. The Tampa Bay area is fortunate to have both a Port Authority and U.S. Coast Guard manage clearance to various waterways and canals. Other areas are maintained through various other agencies under the State, County, and cities. There are initiatives to ensure areas are maintained to some extent (unless in an area designated not to receive such attention) and shorelines are monitored for erosion control. Additional attention may be provided to long-term maintenance issues.

3. **Controlled and/or Prescribed Burns**
   The Bay area is susceptible to urban and wildland fires. Controlled burns and urban preventative fire programs will assist in managing this specific hazard issue. Additional citizen awareness programs will only serve to augment current programs implemented through city and county initiatives.

4. Debris Movement and Management

The ability to clear debris from roads and lands is necessary for immediate and long-term recovery. Mitigating actions include equipping trucks with necessary equipment and coordinating efforts to dispose of debris. Associated with this initiative is the process of reviewing areas that may produce great quantities of debris from natural features, such as with trees and other types of foliage. The County has implemented such a program; however, additional efforts in private homeowner techniques for private property will assist to an even greater extent.

5. Development Management

Development management refers to the use of planning tools and techniques to reduce the threat of damage from disasters. Such tools can also be used to help direct long-term development patterns in a manner that can help minimize future threats. For example, greenways and parks could be developed in flood prone areas to collect water and minimize flooding to surrounding structures. Facilities or structures, which have undergone repetitive damage, could be relocated to more secure areas. Flood management plans can help to direct efforts to reduce the community's vulnerability to flooding. Through such long-term redevelopment plans, the cities and County can help to create neighborhoods that are more disaster-resistant.

6. Education/Coordination

Public and private-sector coordination is vital for the long-term success of hazard mitigation. Recent efforts have focused on the inventory of critical facilities and the needs and desires of the public departments/agencies within Hillsborough County. Now that the assessment phase is nearing completion, efforts are being made to pull in more private sector participation. Home shows and web announcements have begun the process of alerting the public and private sectors as to the purpose of Hazard Mitigation. The Community Ratings System's Outreach Strategy Group has brought in private sector participation and is establishing precedents for cooperation between municipalities within Hillsborough County. Exposure through newspapers, government cable access channels, and county web pages will continue to keep interested parties informed and educated while new initiatives are being created and implemented.

Increased educational awareness of the need for and importance of hazard mitigation can help to encourage home and business owners to retrofit their structures for improved protection. Hurricane-related hazard mitigation education has been provided by the Tampa Bay Regional Planning Council in concert with the Hillsborough County Emergency Operations Center and by local newspapers and television stations prior to the annual hurricane season. These efforts are designed to encourage home and business owners to make preparations in advance of each hurricane season. For example, in 1993, the Tampa Bay Regional Planning Council working with the Architecture Program at the University of South Florida prepared a Hurricane Preparedness Home Self Inspection checklist. This pamphlet was made available to homeowners to show them how to storm proof their homes.

There may be opportunities to encourage home and business hazard mitigation efforts through increased emphasis on education. These efforts may include, but are not limited to, adding a Hazard Mitigation link to internet websites, utilizing

the City of Tampa's and Hillsborough County's Government Access Television networks to provide public service announcements or infomercials on hazard mitigation techniques, coordinating with local utility companies to provide reminder notices along with monthly statements, alerting residents of the need to purchase insurance riders if their home insurance does not cover replacement of structure to current codes, presenting workshops and seminars devoted to building contractors and homeowners interested in applying mitigation measures, and promoting state and federal assistance that is available for hazard mitigation.

7. Emergency Services/Emergency Management Enhancements

The coordination of emergency services during times of disaster is through the Public Safety Department's Emergency Operations Center (EOC). For many natural disaster events, the National Weather Service issues various types of warnings, which the Emergency Management Operations Center uses as indicators, and thus initiates community activities appropriate to the potential threat of the event. Additionally, various road and street departments furnish various levels of assistance to County residents throughout the county. If evacuation is deemed necessary, the EOC opens shelters in affected areas and coordinates the activities of the Sheriff's Office, the Red Cross Emergency Medical services and other agencies as required to accomplish a safe evacuation.

Although emergency management operations are normally addressed through the Emergency Operations Center, there are mitigation activities that can also provide an emergency management benefit. For example, the identification of alternative sites for governmental operations during and after a disaster can help to ensure essential governmental services are continuously provided to the public. The acquisition and installation of emergency generators can also help to ensure no disruption in services.

In addition, educating residents of what to do in case of an emergency can also help to mitigate potential loss of life in such incidents. For example, providing information to residents on what to do in the event of a hazardous materials incident could help to reduce injuries and potential health consequences associated with airborne toxic chemicals.

8. Flood Control

Generally, flood control techniques involve making improvements to the stormwater and drainage facilities to improve the flow of floodwaters or that will reduce areas subject to periodic floods. These techniques involve the rehabilitation and expansion of storm drains, the creation of retention ponds and the use of innovative planning to divert natural drainage patterns away from structures.

9. Flood Reduction/Protection

Flood reduction involves techniques for flood control and protection such as elevating homes or land on the property owner's side and stormwater and drainage improvements from the county's side. Typical retrofits for flooding include elevating buildings above the flood hazard level, providing watertight closures for doors and windows, and using floodwalls around ground level openings. Alternatively, such openings could be eliminated. Also included is the use of water-resistant materials, structural reinforcements to withstand water

pressures, and placement of mechanical elements in the upper parts of the building. Stormwater and drainage mitigation typically includes improvements to the facilities to better control the flow of floodwaters or reduce areas subject to periodic flooding. These techniques involve the rehabilitation and expansion of storm drains, the creation of retention ponds and the use of innovative planning to divert natural drainage patterns away from structures. A separate area of flood reduction includes consideration given to " nuisance" flooding. Consideration of increased partnerships with development interest to improve parking in areas of known parking lot and street flooding.

10. Hazardous Materials (HazMat)

Mitigation of Hazardous Material incidens includes techniques to reduce losses to emergency personnel, citizens, structures, and the environment. These techniques include extensive training to personnel as well as notification and education of the public. Notification systems alert citizens in case of a disaster (i.e. sirens located throughout the Port of Tampa). Homeowners can also safeguard themselves by including "safe rooms" in their houses to reduce exposure.

The county participates on the regional Local Emergency Planning Committee (LEPC) which works together with other local governments, the private sector, and citizens to identify mitigation measures, projects and insure the public's right to know under SARA Title III.

11. Mechanical Maintenance

The administration and maintenance associated with critical facilities is a major component to Hazard Mitigation. So much so, that this report dedicates complete sections that illustrate vulnerability and avenues required for protection of various facilities. A principal purpose for the Local Mitigation Strategy is to illustrate avenues to maintain operations of certain facilities to ensure society will continue to operate after (and during) various disasters.

12. Power/Back-up Power

In the aftermath of a disaster, power to recovery teams and structures is vital. Some techniques that could be used include providing maintenance units with back-up power capabilities via generators or other power alternatives. In addition, critical facilities can be equipped to accept alternative sources of power.

13. Flood Prevention

Through the regulatory/review activities of the various planning agencies, the preservation of open space and the restriction of development in the floodplain is a priority. The various development codes (LDC) provide regulations that restrict and manage development activity in the floodplain by limiting wetlands encroachment and preserving open space.

The enforcement of the land-development code ensures that all new development retain and attenuate respective amounts of stormwater runoff created. Specifically, various Public Works departments will evaluate each flood event to determine the effectiveness of recently constructed projects and identify potential additional projects or improvements. Additionally, the County's budget includes funding for the completion of the Stormwater Management Plans for the County's

seventeen basins identified in the Stormwater Management Element of the County's Comprehensive Plan.

Additionally, the cities and the County will continue to take the appropriate actions to maintain the stormwater-management systems. The Water Department, through maintenance programs funded by its operating budget, maintains the stormwater conveyance systems to ensure that flooding impacts are minimized.

14. Property Protection

The County is working toward establishing a funding source that will work towards the acquisition of properties that have experienced repetitive losses due to flooding. Through land acquisition purchases by the Environmental Land Acquisition Program, Hillsborough County communities will continue to remove property located in the floodplain from the impacts of development. The continuing impact of this program on flood mitigation is important because the removal of property located in the floodplain and its preservation as passive recreation areas maintains storage capacity and removes floodplain area from potential development. A complimentary benefit is the acquisition of adjacent uplands as open space that further reduces the introduction of impervious surface that can contribute to flooding problems.

Additionally, through the enforcement of floodplain ordinances (for all but one community within the county) and in conjunction with participation in the National Flood Insurance Plan's Community Rating System, structures located in floodplains will continued to be identified for elevation to mitigate for their location in flood prone areas. This is viewed as a major contribution toward mitigating the impacts of flooding.

All but one community within the county will continue to actively participate in the National Flood Insurance Program. A major contribution to this effort is the recognition that respective Community Rating System programs that are managed by full-time staff members. To this end, communities within the county have begun to develop a Hazard Mitigation program staffed full-time. As part of the program, it is recognized that a major emphasis should be placed on the education of those property owners who are located in the floodplain that they should secure flood insurance. Given the fact that FEMA indicates that 22,000 properties in the County participate in the NFIP and that the County's research has indicated that there are over 38,000 parcels located full or in part in the floodplain, success in this area will help to make certain that property losses in the floodplain will be covered by insurance.

15. Public Information

The County has undertaken various activities that advise property owners concerning the hazards and potential mitigating activities associated with building in the floodplains.

Residents, both existing and potential, can access information relating to the floodplains via the Hillsborough County Development Services Division or by contacting FEMA directly. Floodplain determinations can be requested that provide an official determination of whether a property is located, fully or partially, within a floodplain. Additionally, the County has mapped the floodplains on its

Geographical Information System (GIS). The County has also mapped the storm surge from hurricanes based on the SLOSH model.

16. Recovery/Damage Assessment

The back-end side of mitigation includes providing means to recover and rebuild in a post-disaster situation. Critical facilities will need to be brought back online and damage teams will need to survey problem areas. Recovery mitigation includes providing navigation systems to locate facilities when typical traffic aids no longer exist.

17. Sheltering and Housing

Evacuation shelters are available for the County's designated population (persons within evacuation zones). However, if a great number of persons came into the area or a great number of persons not within a designated evacuation area evacuate, shelter space is inadequate. Additionally, a greater number of "short-term shelters are required for persons that could become potential evacuees due to hazardous materials or other chemical, biological or radiological situations caused through spills, vandalism, or other domestic violence situation.

18. Structural Projects/Structural Hardening

The County's Stormwater Program was approved by the Board of County Commission in fiscal year 1998. These activities include projects that implement the County's Master Drainage Plan. County staff reviews, evaluates and prioritizes needs so that available funding is allocated to those projects that are most critical in alleviating flood impacts.

The County, as part of its Capital Improvements Program continuously provides funding for the reconstruction of obsolete storm sewer systems. This activity includes the replacement of storm pipes, manholes, end walls, culverts and conveyance systems. The CIP also provides funding for individual projects designed to alleviate flooding problems in specific locations in the County.

Each development, whether private or public, is required to meet the provisions of the Stormwater Technical Manual. Instead of providing reservoirs to store stormwater runoff, each project must provide on-site retention of its runoff and/or tie in to the County's stormwater system. As part of the County's effort to retrofit its stormwater system, funding in the Capital Improvement Program is provided to acquire property and construct stormwater retention facilities to alleviate flooding impacts to roads and private property.

19. Transportation Systems

There are numerous transportation systems within the county that include railroads, airports, a seaport, and various highway systems that include both land and water routes and State and Federal highway systems. Transportation systems will be effected by major catastrophic events with higher category tropical storm having the largest impact to the area.

20. Wind Protection

Wind protection focuses on reducing the damage from wind by strengthening floors, foundations, and wall/floor attachments of existing structures. Some common techniques that help prevent internal structural damage include the use

of storm shutters and shatterproof glass or windows that are rated for the design speed of the site. Improving the way roofs are attached to the walls (i.e. using gable end bracing on frame gables, nail patterns, roof sheathing, hurricane straps, etc.) can keep roofs from lifting up in hurricane-force winds.

B. EVALUATION CRITERIA

The Local Mitigation Strategy Working Group (Group) considers all projects that focus on mitigating losses created by natural or man-made disasters. Priorities are given to those projects that first demonstrate the use of mitigating techniques that are (1) cost-beneficial, (2) technically feasible and (3) environmentally sound.

Based on the detailed hazard identification and vulnerability analysis (See Risk Assessment, Section IV), the LMS Working Group has the ability to assess the potential risk of the hazard and the cost benefit associated with mitigating the impacts of a specific hazard. Although this criteria has the same weight as other listed criteria, it provides the Group with the ability to perform an internal review of similar projects associated with their respective jurisdiction and possible inclusion into respective Comprehensive and Capital Improvement Plans.

It should be emphasized that Hillsborough County is a large and diverse county. There are significant demographic and geographic differences from one area of the county to the next. Hazard mitigation needs are therefore expected to vary among the four jurisdictions. Priorities within one community may not necessarily reflect the priorities of another community. Through the evolution of the Local Mitigation Strategy planning process developed provides an internal system to prioritize projects and identify lead agencies responsible for a project's implementation.

The process illustrated provides an operational framework in which the Local Mitigation Working Group will prioritize mitigation projects.

The one factor that has not been identified prior to this Section is the Social Cost-Benefit Factor. This is a factor that illustrates a cost-benefit based upon population that will benefit from the study, improvement or facility. This benefit is then multiplied with the "Risk Factor" identified under the Risk Assessment Section of this report. The equation is a hybrid of that provided by the State for use within the 1998/99 Flood Mitigation Assistance grant program. The Local Mitigation Strategy Working Group's model/equation is as follows:

A = Risk Factor that is obtained from the table within the Risk Assessment Section (see page IV-10 of this report)
B = Population in the Community to Benefit from the Project
C = Total Community Population
X = Social Cost-Benefit Factor

Equation: $X = (A) * (B/C)$

Example: A drainage Project within the City of Temple Terrace to resolve an area flooding issue. The Risk Factor that is obtained from within the Risk Assessment Table for Flooding is "6". The Temple Terrace Population is 20,210 plus there is an additional

population outside of the city limits that would be affected of 7,790. Total Affected Project Population is 28,000

X = A * (B/C)
1. (6) * (1.385) = 8.31
2. X = 8.31

Figure 5

PROJECT EVALUATION WORKSHEET

Project Description:	(city hall/fire station/lift station, etc.)
Proposed Mitigation Measure:	(window protection/elevation, etc)
Submitted By:	(municipality/agency/department, etc.)

Criteria	**Yes/No**
The proposed measure is warranted by the countywide vulnerability analysis?	
If accomplished, the measure would enhance essential/critical services?	
The project is not in conflict with Growth-Management or Floodplain Management Plans?	
The measure is not a short-term improvement?	
The measure is consistent with Local Mitigation Strategy's goal and objectives?	
More than one Local Mitigation Strategy objective is met?	
It meets goals and objectives of the Comprehensive Emergency Management Plan?	
Benefit exceeds cost?	
The owner(s) is committed to the project and will match funds as necessary?	

Selection of a project will be based upon its priority. The following illustrates the manner in which a priority is obtained: 8-9 items answered yes equals a "Priority" of 1; 6-7 items answered yes equals a "Priority" of 2; and 4-5 items answered yes equals a "Priority" of 3.

C. IMPLEMENTATION OF MITIGATION MEASURES

A list of hazard-mitigation projects/initiatives is maintained as a part of the Local Mitigation Strategy Planning Process (Appendix G). This list includes the prioritization, Implementation and administration information (Timeline, Funding sources and other resources and agency/personnel responsible).

The list is updated and reviewed at least annually consistent with Section VII, LMS Plan Maintenance. Those projects which have been accomplished are moved to the Accomplishments List (See Appendix H). This provides a clear direction for the strategy and demonstrates the state and local commitment to a safer community.

Those projects which receive the highest priority and the community elects to submit for federal funding will undergo a cost-benefit analysis consistent with FEMA requirements under the PDM, FMA and HMG Programs.