JOINT UNIFIED LOCAL MITIGATION STRATEGY

LEE COUNTY

Local Mitigation Strategy Table of Contents

INTRODUCTION

Purpose of Local Mitigation Strategy

The Joint Unified Local Mitigation Strategy (LMS) presented here represents a plan to promote mitigation initiatives to improve resilience to hazards posing a threat to communities within Lee County. The basis for the strategy lies in Southwest Florida's continuing threat from certain large scale hazards and the need to lessen the human, economic, and environmental costs of disasters resulting from these hazards. It will also be used as a tool to establish funding priorities for hazard mitigation activities for disaster assistance available following a major disaster.

The strategy has also been restructured to comply with Lee County Plan Policy 110.1.5, which states the County will maintain the floodplain management plan, analyze the flooding problem of the unincorporated areas of Lee County, inventory the flood hazard area, review possible activities to remedy identified flooding problems, select appropriate alternatives, and formulate a schedule for implementation.

The Local Mitigation Strategy's purpose will be achieved through the process of hazard mitigation. As used in the LMS, "hazard mitigation" refers to any actions taken by local governments, other government entities, or private interests to permanently reduce or eliminate long-term risks to people and their property from the effects of natural or manmade disasters. In this regard, the Local Mitigation Strategy is a planning document. As such, the strategy is tied directly to the overall policies contained in the Lee County Comprehensive Emergency Management Plan (CEMP).

The initial Joint Unified Local Mitigation Strategy was adopted by Lee County and participating municipalities in January 2000. The Lee County Floodplain Management / Hazard Mitigation Plan was adopted in 1999. The second update of the Local Mitigation Strategy was adopted in 2007, and the third in 2012. The 2012 update included more scientific and technically based risk assessment techniques to determine the threats of hazards to people and property in Lee County than any of the previous plans.

Updating the LMS for adoption in 2017 involved a process whereby the vulnerability and risk to all identified natural and manmade hazards were assessed for the county and its six municipalities; plans, programs and projects to lessen the effects of disasters were identified. This risk analysis included four main components: hazard identification, profiling hazard events, asset inventory, and estimation of potential loss. The methodology and focus areas used to conduct this analysis are described in the Hazard Identification and Risk Assessment section of this plan. The Lee County Comprehensive Plan predicts significant growth for Lee County through the year 2030. A summary as it pertains to future land use and development trends can be found in Appendix A: Development Trends.

Benefits

Updating and maintaining the Joint Unified Local Mitigation Strategy results in:

- Maintaining eligibility for certain funding sources, which require an updated LMS.
- Reducing the local government's required cost sharing ratio necessary for obtaining certain types of post-disaster grant funding.
- Streamlining the receipt process for post-disaster state and federal funding through the pre-identification of mitigation initiatives.
- Supporting more effective pre- and post-disaster decision making efforts.
- Lessening each community's vulnerability to disasters by focusing limited financial resources to ranked initiatives.

LMS PLANNING PROCESS

Introduction

This section documents the process used to develop the strategy, how it was prepared, who was involved in the process, and how the public was involved.

Strategy Preparation and Organization

The LMS Working Group hired Hagerty Consulting, a preparedness and recovery consulting firm, to facilitate the 2017 update to the LMS. Hagerty Consulting awarded a subcontract to the consulting firm Dewberry, to conduct the Hazard Identification and Risk Assessment (HIRA) for this update. The planning process was conducted under the supervision of the Local Mitigation Strategy's Working Group ("LMS Working Group") and designated Emergency Management staff.

Drafts of the updated strategy were reviewed by the Lee County Disaster Advisory Council (DAC), which is designated to guide pre-disaster and on-going mitigation efforts. This council, initially formed in 1990 as the Recovery Task Force, has been established by the Lee County Post Disaster Ordinance and serves as the county's LMS Working Group. The LMS Working Group Chair or designee coordinates mitigation activities. Membership on the council includes:

- County department heads or designees from a variety of administrative and operational agencies;
- Representatives from Lee County Community Development;
- Local planning agency member;
- Community representatives from, hospitals, the Department of Health, and utility companies;
- Liaisons from each municipal government in Lee County (Bonita Springs, Cape Coral, Estero, Fort Myers, Fort Myers Beach and Sanibel);
- Sheriff, school, and fire representatives;
- Regional governmental bodies;
- Other representatives as appointed by the Board of County Commissioners of Lee County.

Each jurisdiction in Lee County has a liaison on the LMS Working Group who participates in the same manner as the other Working Group members. The LMS Working Group composition and member responsibilities are listed below. Meeting minutes, sign-in sheets and associated materials, are contained in Appendix C.

This process also adhered to guidelines of the National Flood Insurance Program's Community Rating System by including staff responsible for land use and zoning, construction permitting and related code enforcement, floodplain management and mitigation, flood insurance education and other outreach topics.

Municipal jurisdictions covered under this plan include City of Bonita Springs, City of Cape Coral, Village of Estero, City of Fort Myers, Town of Fort Myers Beach and City of Sanibel.

Jurisdictional Representatives include:

- City of Bonita Springs – Director of Neighborhood Services,
- City of Cape Coral – Emergency Management Division Manager
- Village of Estero – Fire Chief and Planning Staff
- City of Fort Myers – Program/Fiscal Manager, Fire and Emergency Management

- Town of Fort Myers Beach – Director of Community Development
- City of Sanibel – Chief of Police

Public Involvement

A total of six meetings to review and comment on the update were conducted. Five out of the six meetings were publicly noticed and advertised, while the sixth was for Working Group review.

- The first public review came with the announcement of the draft plan at the LMS Working Group meeting conducted on August 22, 2016 at the beginning of the process.
- The second public meeting was held on September 19, 2016 where discussions continued on the update process and project formulation.
- The third meeting took place on November 1, 2016 and covered the planning process, review of current LMS goals and hazards and a project timeline discussion.
- The fourth meeting was conducted at the December 13, 2016 LMS Working Group Meeting where the core list of hazards and the HIRA methodology were discussed.
- The fifth public meeting was conducted at the January 27, 2017 LMS Working Group meeting and the draft HIRA and discussion began on the updated LMS strategies for each of the municipalities and towns along with the county strategies.
- The sixth and final public meeting was held on March 8, 2017 to review the full draft plan to include the HIRA and update county and city mitigation strategies and projects.
- An additional meeting was held on March 31, 2017 to conclude the planning process.

The draft plan was posted online for comment at www.leeeoc.com. Comments from the public were accepted and reviewed for inclusion into the plan.

Coordination with other Agencies

Emails encouraging comments on the plan were sent to applicable agencies who are participants in the Disaster Advisory Council/Local Mitigation Strategy Working Group.

The planning process included a review of goals, objectives and policies contained in County and municipal comprehensive plans. Also reviewed were the Florida Coastal Construction Control Line Program, the Lee County Beach Management Plan, the Lee County Comprehensive Emergency Management Plan, the Lee County Post-Disaster Redevelopment Plan, and the Joint Unified Public Information Strategy for all Hazards, the Caloosahatchee Forestry Center's Mitigation Action Plans, and the State of Florida Enhanced Hazard Mitigation Plan.

Planning Process

The Lee County Disaster Advisory Council, serving as the LMS Working Group, represents all the local jurisdictions and key organizations participating in the planning process. The LMS Working Group is also responsible for reviewing the strategy's goals and objectives, revising them as necessary, reviewing the technical analysis and planning activities of the plan, approving proposed mitigation initiatives for incorporation into the plan, determining the priorities for implementation of those initiatives, and for removing or terminating initiatives that are no longer desirable for implementation.

What follows is a summary of the steps taken to update the Joint Unified Local Mitigation Strategy.

Hazard Identification and Risk Estimation

Building upon the 2010 LMS Hazard Identification, an all-hazards approach to identify, classify, and quantify the risk and vulnerability of natural and manmade hazards that threaten all or portions of the community was used for the 2016 HIRA. Depending on the participating jurisdiction, a variety of information resources regarding hazard identification and risk estimation were available. Hazard specific data and maps were used, whenever applicable, and GIS-based analysis was conducted of hazard areas and the locations of critical facilities, infrastructure components, and other properties located within the defined hazard areas. The likelihood or probability that a hazard will impact an area, as well as the consequences of that impact to public health and safety, property, the economy, and the environment, were evaluated. This comparison of the consequences of an event with its probability of occurrence is a measure of the risk posed by that hazard to the community. The estimated relative risks of the different hazards it has identified were compared to highlight which hazards should be of greatest concern during the upcoming mitigation planning process.

Valuations and potential losses by hazard for every structure located within the county were determined and incorporated into each hazard. By analyzing valuation and potential losses for the county on a parcel by parcel level, the Working Group received a more complete picture of potential damage.

Estimating the relative risk of different hazards was followed by the assessment of the vulnerabilities in the likely areas of impact to the types of physical or operational agents potentially resulting from a hazard event.

Vulnerability Assessment

The method used required a methodical, qualitative examination of the vulnerabilities of all structures within the county to the impacts of future disasters. Hazards were ranked on an index based on the probability, maximum impact, and probable hazard magnitude. This process resulted in identification of specific vulnerabilities that can be addressed by targeted mitigation initiatives proposed, and incorporated into this strategy. The LMS Working Group also reviewed past experiences with disasters to see if those events highlighted the need for specific mitigation initiatives based on the type or location of damage they caused. The LMS Working Group was then asked to review and comment on the HIRA during the planning process.

Developing Hazard Mitigation Initiatives

A procedure for characterizing and justifying the mitigation initiative proposed by each participating jurisdiction for incorporation into this plan was established in the development of the initial strategy document. The vulnerability assessment enabled the LMS Working Group to highlight the most significant vulnerabilities and to assist in prioritizing subsequent efforts to formulate and characterize specific hazard mitigation initiatives to eliminate or minimize those vulnerabilities. Once the highest priorities were defined, the LMS Working Group participants identified specific mitigation initiatives for the plan to eliminate or minimize those vulnerabilities. This procedure involved describing the initiative, relating it to the goals and objectives established by the LMS Working Group, and ranking it based on its economic benefits and/or protection of public health and safety. A “benefit to cost” criterion was evaluated for each initiative to demonstrate whether it would indeed be worthwhile to implement when resources

become available. Further, each proposed mitigation initiative was ranked for implementation in a consistent manner by each participating organization using a set of eleven objective criteria.

Developing the Local Mitigation Action Plan

The LMS Working Group's review of this process included evaluating the initiative's consistency with the LMS goals and objectives, level of public demand for the proposal and its potential for conflict with other jurisdictions' programs or interests. Mitigation initiatives currently in the plan were evaluated to determine if each is still valid or if its implementation should be a priority or deferred until a later time.

Approval of the Current Edition of the Strategy

At the end of the planning period, the prepared document was released to the community and for action by the elected governing bodies of the jurisdictions and organizations that participated in the planning process. By resolution, the governing body approves, endorses, or acts on its own component of the plan and addresses the implementation of mitigation initiatives its own representatives proposed. Resolutions for adopting the strategy document by each governing body can be found in Appendix D.

Implementation of Approved Mitigation Initiatives

Once incorporated into the Joint Unified Local Mitigation Strategy, the agency or organization proposing the initiative becomes responsible for its implementation. This includes developing a budget for the effort, or making an application to state and federal agencies for financial support for implementation.

HAZARD IDENTIFICATION AND RISK ASSESSMENT

Introduction

The purpose of this document is to provide a countywide overview of how various natural and manmade hazards impact Lee County, Florida. This Hazard Identification and Risk Assessment (HIRA) undertakes an all-hazards identification, classification, and vulnerability indexing process to ensure hazard analysis is comprehensive and all-encompassing.

For the purposes of this HIRA, a natural hazard is defined as an event or physical condition that has the potential to cause fatalities, injuries, property and infrastructure damage, agricultural loss, damage to the environment, interruption of business, etc. A manmade hazard includes any disastrous event caused directly and principally by one or more identifiable deliberate or negligent human actions. Technological hazards, a hazard originating from technological or industrial conditions, including accidents, dangerous procedures, or failures, are also considered a type of manmade hazard in this HIRA.[1]

Identifying the risk and vulnerability for a community is critical when determining how to allocate finite resources to carry out feasible and appropriate mitigation actions. The hazard analysis involves identifying all of the hazards that potentially threaten Lee County, and then analyzing them individually to determine the degree of threat posed by each hazard. Addressing risk and vulnerability through hazard mitigation measures will reduce societal, economic, and environmental exposure to hazard impacts.

This HIRA will be reviewed yearly along with the LMS at the quarterly DAC/LMS meetings. The review will be coordinated by the LMS Working Group Chair or designee. A full reassessment of hazards and the county's risk and vulnerability will be conducted every five years with the LMS update, or when deemed necessary.

Summary of Changes

The 2017 plan consolidates, updates, and streamlines content from the 2010 hazard identification. As part of the update, the following new manmade hazards were added to the hazard identification and risk assessment section:

- Aircraft Crash
- Cyberattack
- Hazardous Materials Release
- Mass Casualty/Mass Fatality

The foundation of the December 2011 hazard identification remained valid; each hazard was re-evaluated and a new analysis performed, when applicable. This new analysis included, but was not limited to: 1) determining annualized number of hazard events and losses using the National Centers for Environmental Information (NCEI), which was formally known as the National Climatic Data Center or NCDC, and other data sources where available; 2) updating the assessment of vulnerability and risk based on new data; 3) new analysis with updated critical facilities data; 4) creation of hazard maps specific to the county; and 5) providing overall hazard comparisons (presented at the end of this section).

[1] Federal Emergency Management Agency. "Threat and Hazard Identification and Risk Assessment Guide." http://www.fema.gov/media-library-data/8ca0a9e54dc8b037a55b402b2a269e94/CPG201_htirag_2nd_edition.pdf

In addition, each section of the plan was also reformatted to improve clarity, and new maps and imagery were included. The 2013 State of Florida Enhanced Hazard Mitigation Plan, effective August 24, 2013, was reviewed as part of this update and, when applicable, information from the plan has been cited.

Hazard Identification

This section generally describes the hazards that could affect Lee County and discusses their potential impact and why the hazard is analyzed in this LMS. The following hazards are included in this report:

- Natural Hazards:
  - Animal/Plant Disease Outbreak
  - Coastal Erosion
  - Drought/Extreme Heat
  - Epidemic/Pandemic Disease
  - Flood
  - Freeze/Extreme Cold
  - Storm Surge Flooding
  - Sustained Wind (Tropical Cyclones)
  - Thunderstorm Winds/Lightning/Hail
  - Tornado
  - Wildfire
- Manmade Hazards:
  - Aircraft Crash
  - Cyberattack
  - Hazardous Materials Release
  - Mass Casualty/Mass Fatality

Some of these hazards are considered to be interrelated or cascading (i.e., hurricanes can cause flooding, storm surge and tornadoes), but for preliminary hazard identification purposes these distinct hazards are broken out separately. It should also be noted that some hazards, such as freeze/extreme cold, may impact a large area yet cause little damage, while other hazards, such as a tornado, may impact a small area yet cause extensive damage.

The following hazards will not be discussed in this HIRA due to their overall low frequency or low impact in Lee County, Florida:

- Earthquake/Seismic Event
- Sinkhole/Subsidence
- Tsunami
- Volcano
- Dam/Levee Failure
- Major Pipeline Failure
- Major Power Failure
- Major Transportation Route/Bridge Failure
- Radiological Release
- Urban/Major Structure Fire
- Civil Disturbance
- Mass Migration
- Special Events

Federal Disaster Declarations

Past federal disaster declarations and historical storm data were reviewed. Since 1962, 18 of Florida's 1,065 disasters have been declared for Lee County, according to FEMA records.

Table 1 presents all presidential declared disasters that have occurred in Lee County. Historically, hurricanes and tropical storms have caused the most damage in Lee County.

Table 1: Presidential Declared Disasters for Lee County (as of August 2015,)

Disaster Number	Disaster Type	Incident Type	Incident Begin Date	Programs Declared: IH	IA	PA	HM
209	DR	Hurricane	9/14/1965	·	✓	✓	✓
252	DR	Hurricane	11/7/1968	·	✓	✓	✓
304	DR	Freezing	3/15/1971	·	✓	✓	✓
337	DR	Coastal Storm	6/23/1972	·	✓	✓	✓
526	DR	Freezing	1/31/1977	·	✓	·	·
732	DR	Freezing	3/18/1985	·	✓	·	·
851	DR	Freezing	12/23/1989	·	✓	·	·
1069	DR	Hurricane	10/4/1995	·	✓	✓	✓
1223	DR	Fire	5/25/1998	·	✓	✓	·
1359	DR	Freezing	12/1/2000	·	✓	·	✓
1393	DR	Coastal Storm	9/13/2001	·	·	✓	✓
1539	DR	Hurricane	8/11/2004	✓	✓	✓	✓
1545	DR	Hurricane	9/3/2004	✓	✓	✓	✓
1551	DR	Hurricane	9/13/2004	✓	✓	✓	✓
1561	DR	Hurricane	9/24/2004	✓	✓	✓	✓
1609	DR	Hurricane	10/23/2005	✓	✓	✓	✓
1785	DR	Severe Storm(s)	8/18/2008	✓	✓	✓	✓
4068	DR	Severe Storm(s)	6/23/2012	✓	·	✓	✓

NCEI Storm Events Data

The National Centers for Environmental Information (NCEI) Storm Events Database is published by the National Oceanic and Atmospheric Administration (NOAA)'s National Weather Service (NWS). The storm events database contains information on storms and weather phenomena that have caused loss of life, injuries, significant property damage, and/or disruption to commerce from January 1950 to September 2016. Records for the majority of weather events (48 types) were reported starting in 1996, as defined in NWS Directive 10-1605. The exception is tornado events that were recorded from 1950 through 1954 and thunderstorm wind and hail events haven been recorded since 1955. There have been a total of 606 events for the hazards profiled in this report. Total property damages from these events exceed $2.1 billion (not accounting for inflation). If inflation to 2016 is accounted for, total property damages exceed $2.7 billion. *Table 2* summarizes the total events, damages, and losses by hazard in the county. The subsequent hazards specific sections of this chapter will profile the historical events and include, when

applicable, narratives from this dataset. Hazards that are not listed in this table will use other datasets or data sources to estimate the number of events and losses experienced in Lee County.

Table 2: NCEI Hazard Events for Lee County, FL (as of September 2016)

Hazards Type	Period of Record	Total Events	Property Damage (unadjusted)	Property Damage (2016$)	Crop Damage (unadjusted)	Crop Damage (2016$)	Deaths	Injuries
Coastal Flooding (Storm Surge)	1996 - Present	4	$2,300,000	$2,390,000	$0.00	$0.00	0	0
Drought/ Extreme Heat	1996 - Present	4	$0	$0.00	$0.00	$0.00	4	0
Flood	1996 - Present	48	$3,160,500	$4,230,000	$0.00	$0.00	0	2
Freeze/ Extreme Cold	1996 - Present	16	$250,000	$380,000	$23,390,000.00	$33,000,000	0	0
Hurricane Wind Damage	1996 - Present	15	$2,115,815,000	$2,670,000,000	$10,000,000.00	$12,600,000	2	30
Thunderstorm Winds / Lightning / Hail	1955	372	$21,409,500	$33,800,000	$2,000.00	$3,130	12	28
Tornado	1950 - Present	134	$32,748,840	$60,900,000	$0.00	$0.00	1	33
Wildfire	1996 - Present	13	$775,000	$1,070,000	$0.00	$0.00	0	0
Total		606	$2,176,458,840	$2,770,000,000	$33,392,000.00	$45,700,000	19	93

** Zonal damages for 3 regional droughts spanning 1997 – 1999*

The data collection methods for the NCEI Storm Events Database have varied significantly over time. The records kept prior to 1993 were extracted from a manually typed Storm Data Publication. From 1993 to the present the Storm Data Publication was built from the digital records in the database. Additional details on the various collection sources for storm database files used in NCEI's database can be found on the NCEI website. It should be noted that property and crop damage should be considered a broad estimate. The National Weather Service makes a best guess using all available data from a variety of sources at the time of the publication.

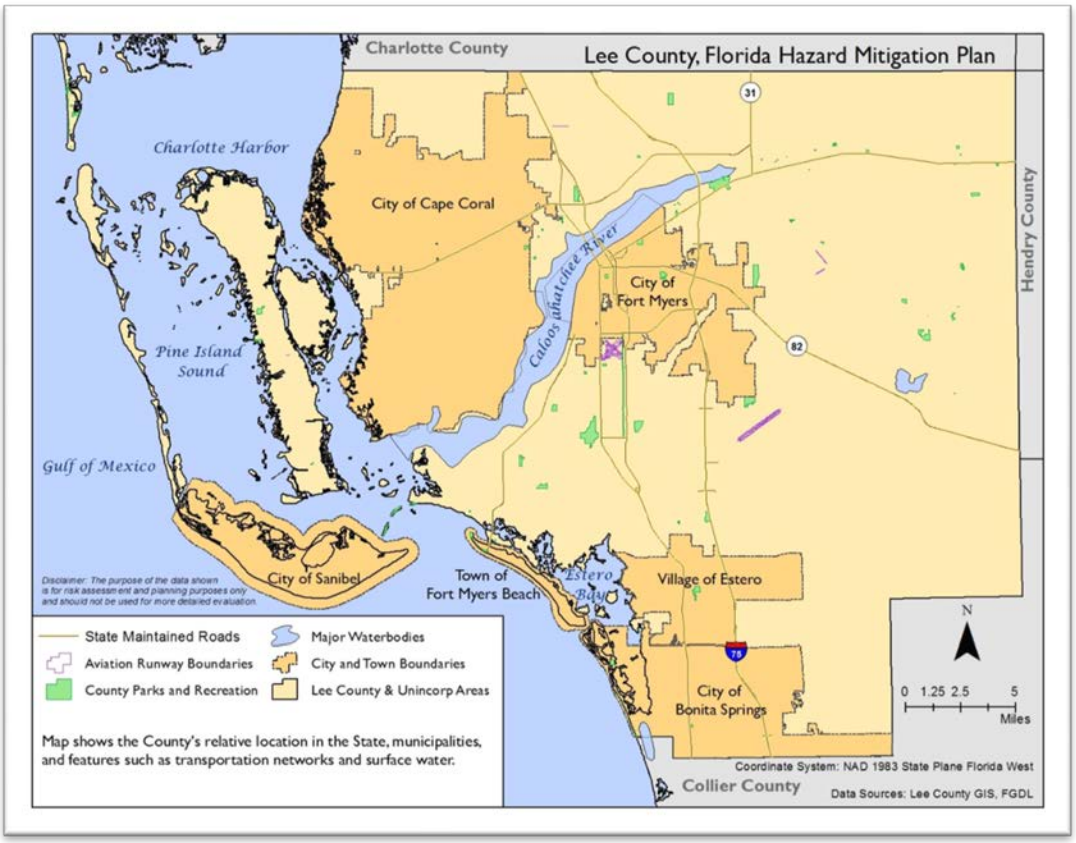
Vulnerability Assessment Overview

The Vulnerability and Risk Assessment identifies and characterizes an inventory of assets and assesses the potential breadth and seriousness of damage that can result from each identified hazard event. The primary objective of this assessment is to quantify exposure and the potential loss by hazard. In so doing, Lee County and partners may better understand their unique risks to identified hazards and be better prepared to evaluate and prioritize specific mitigation actions.

Assets, Infrastructure, and Critical Facilities

The Joint Unified Local Mitigation Strategy includes Lee County and its six municipalities: The City of Bonita Springs, City of Cape Coral, Village of Estero, City of Fort Myers, Town of Fort Myers Beach and City of Sanibel. *Figure 1* shows the jurisdictional boundaries that were used to analyze, calculate, and display hazard risk.

Figure 1: Lee County jurisdictional boundaries and location.



Critical Facilities

An inventory of structures and critical facilities was performed. Critical facilities are vital in maintaining community function and include emergency response facilities such as: law enforcement, fire, and emergency medical services (EMS) stations; hospitals, nursing homes, and care facilities; schools; local government buildings; and important transportation facilities, including airports, parks, water treatment plants, and waste water treatment plants.

The table below summarizes the total number of critical facilities in Lee County, 1,478, by facility type. Excluding the Top 100 Employers, the most common critical facility in Lee County is schools, with 205 total including private and public schools. *Table 3* organizes the distribution of critical facilities by facility type and jurisdiction.

Table 3: Summary of Critical Facilities within each Jurisdiction by Type

Jurisdiction	City of Bonita Springs	City of Cape Coral	City of Fort Myers	City of Sanibel	Town of Fort Myers Beach	Unincorporated County	Village of Estero	Number of Facilities
Armory	0	0	1	0	0	0	0	1
Communication	1	4	3	3	0	10	0	21
Correctional Facility	0	0	5	0	0	0	0	5
Electrical	3	7	4	1	0	23	1	39
Emergency Medical Service	3	8	4	1	2	27	1	46
Emergency Operations Center	0	0	1	0	0	0	0	1
Fire Station	5	10	6	2	2	37	4	66
Fueling Site	0	0	0	0	0	1	0	1
Gas Station	13	32	35	2	4	94	9	189
Government Building	4	6	33	5	5	30	2	85
Hazardous Material Site	10	7	19	4	1	54	6	101
Health Care Facility	9	37	29	0	0	52	4	131
Landing Zone	0	1	1	1	0	19	1	23
Law Enforcement	1	3	9	1	0	17	0	31
Private School	7	18	23	1	1	43	1	94
Red Cross	0	1	3	0	1	4	0	9
School	5	26	29	1	1	47	2	111
Sewage Treatment Facility	4	4	2	2	0	47	4	63
Shelter	1	4	4	0	0	18	3	30
Solid Waste	0	0	0	0	0	2	0	2

Jurisdiction	City of Bonita Springs	City of Cape Coral	City of Fort Myers	City of Sanibel	Town of Fort Myers Beach	Unincorporated County	Village of Estero	Number of Facilities
Supermarket	5	14	7	0	1	30	5	62
Top 100 Employers	24	44	61	6	7	122	13	277
Transportation Facility	0	1	2	0	0	3	0	6
Water Treatment Facility	3	9	1	1	0	61	1	76
Total	97	237	281	31	25	752	55	1478

Building Data

Lee County building footprint data was analyzed with the 2010 Census TIGER tract level data to estimate the total property value for each footprint. The analysis presumes equal distribution of property value based on building footprint area. For example: 10 buildings with 10,000 square feet in a tract value of $1,000,000 would each be valued at $100,000.

Table 4 summarizes the total number and value of building footprints by jurisdiction. Lee County unincorporated areas represent 48 percent of the total number of building footprints and 46 percent of the total building value exposure.

Table 4: Total Buildings and Property Value

Jurisdiction	Total Buildings	% Total Buildings	Property Value	% Total Property Value
City of Bonita Springs	22276	8%	$7,120,000,000	9%
City of Cape Coral	73639	26%	$19,800,000,000	24%
City of Fort Myers	25093	9%	$8,560,000,000	10%
City of Sanibel	4767	2%	$2,120,000,000	3%
Town of Fort Myers Beach	3296	1%	$1,840,000,000	2%
Unincorporated Areas of Lee County	135869	48%	$38,400,000,000	46%
Village of Estero	15991	6%	$4,810,000,000	6%
Total:	280931		$82,650,000,000	

Hazard Ranking

A standardized methodology, which allows for greater flexibility and subject matter expertise, was developed to compare different hazards' risk. This method prioritizes hazard risk based on a blend of quantitative factors extracted from NCEI and other data sources. Many of the hazards assessed in this HIRA did not have quantifiable probability or impact data, thus a semi-quantitative ranking system was used to compare all of the hazards of interest instead. These include:

- Likelihood of occurrence (probability);
- Likely range of impact (warning time); and
- Probable level of impact (maximum impact and deaths and injuries).

Each hazard was ranked from 1 (low), 2 (medium), and 3 (high) in four categories, which were then weighted and averaged together to develop a Composite Hazard Index. This index was then used to rank the hazards as high, medium, or low. *Table 5* provides a summary of the categories used to rank the hazards and their weighted values for the Composite Hazard Index.

Table 5. Hazard Evaluation Priority Categories and Scores

Score	Probability	Direct Deaths and Injuries	Maximum Impact (Annual Damages)	Warning Time
Weighting	1.25	1.0	1.25	0.5
1	Somewhat Likely - Infrequent occurrence with at least one NCEI documented event and annual probability less than 0.5	None recorded	Less than $50,000	Extended: Three days or more
2	Likely - Frequent occurrence with at least some NCEI documented events and annual probability between 1.0 and 0.5	Any Injuries recorded but no deaths	Between $50,000 and $150,000	Minimal: 1 - 2 days
3	Highly Likely - Common events with annual probability greater than 1.0	Any Death(s) recorded	Over $150,000	No Notice: Less than 24 hours

Natural Hazard Profiles

Animal/Plant Disease Outbreaks

Description

Florida has a tropical climate, unique animal and plant life, and robust agriculture industry. This can make Florida's residents and industries susceptible to the introduction of foreign plant and animal pests and diseases. Medfly, citrus canker, and melaleuca are a few examples of alien invasive species that have had a huge impact on Florida residents, growers, and the State's environment in recent years. Medfly is a devastating pest of more than 200 varieties of fruits, nuts, and vegetables. Citrus canker, a serious disease of most citrus, causes lesions on leaves, stems, and fruit, as well as premature fruit drop. In Florida, not only is there an abundance of commercial citrus crops to serve as hosts, but there is a plethora of backyard citrus, as well. Melaleuca and other noxious weeds threaten to crowd out native Florida vegetation and deplete essential natural resources, including unique ecosystems such as the Everglades (USDA).

Invasive exotic species are also a problem in Lee County. From Lee County, the following definitions are used to describe plants as either naturalized or exotic[2]:

- Exotic: A species introduced to Florida, purposefully or accidentally, from its native range outside of Florida;
- Native: A species whose natural range included Florida at the time of European contact (1500 AD);
- Naturalized Exotic: An exotic that sustains itself outside cultivation, outside its native range (it is still exotic; it has not "become" native);
- Invasive Exotic: - A naturalized exotic that is expanding its range into natural areas and disrupting naturally occurring native plant communities.

Location and Extent

The most vulnerable locations to animal/plant disease outbreaks are the agricultural properties and natural areas within Lee County. These agricultural properties and natural areas are located mostly within the unincorporated areas of the County. However, residents that grow their own citrus trees can also be affected in the incorporated areas of Lee County. Significant outbreaks in Lee County could impact over 800 farms throughout the county causing tens of millions of dollars in losses overall.

Previous Occurrences

Citrus canker was discovered in Manatee County in 1986. It was declared eradicated by 1994. Three years later the plant disease was found again on the west coast of Florida where the 1980s outbreak had occurred. From August 2002 to January 2006, the Florida Department of Agriculture and Consumer Services destroyed about 660,000 citrus

[2] Invasive Plants. Lee County Southwest Florida. http://www.leegov.com/conservation2020/landmanagement/invasive-plants

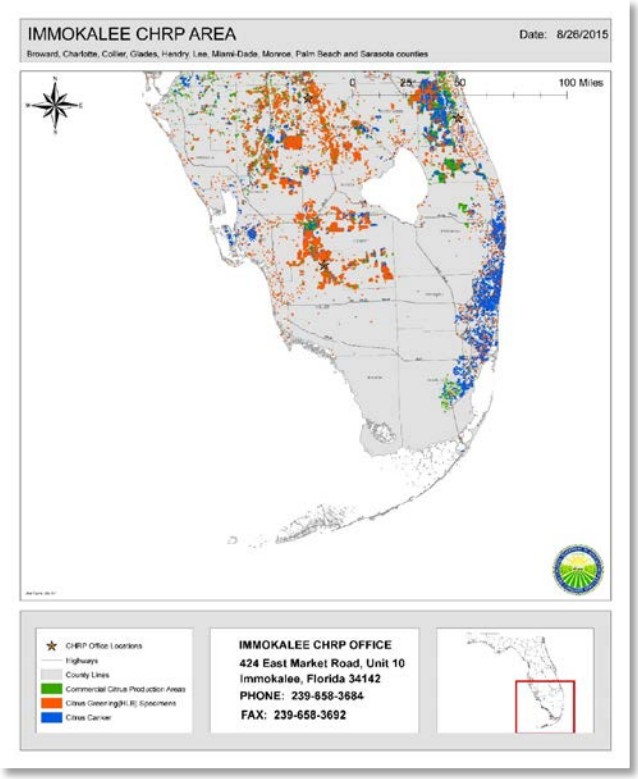
trees, some of which were in Lee County, to prevent an outbreak of citrus canker. Many trees on private property were forcibly destroyed in an attempt to control this contagious disease during that time period[3].

The Florida Department of Agriculture and Consumer Services produced a map in August 2015 that shows areas affected by citrus canker (shaded in blue) and other agricultural diseases (*Figure 2*).[4] It is important to note that there are several concentrations of citrus canker disease in Lee County.

Probability of Future Events

Animal/plant disease outbreaks can cause significant economic losses to the agricultural industry. Human life is also at risk to some of the diseases that can be transmitted through food importation. *Table 6* is a summary of the 2012 statistics for farms in Lee County and the property value[5]. This does not include private homeowners who grow and distribute citrus from their properties.

Figure 2: Citrus Canker and other Agricultural Diseases in Southern Florida



[3] "Lee homeowners win final judgment in citrus canker case", news-press.com, http://www.news-press.com/story/news/2014/08/31/lee-homeowners-win-final-judgment-citrus-canker-case/14885737/

[4] Florida Department of Agricultural and Consumer Services. http://www.freshfromflorida.com/Divisions-Offices/Plant-Industry/Agriculture-Industry/Citrus-Health-Response-Program/Citrus-Quarantine-and-Disease-Detection-Maps

[5] 2012 Census Volume 1, Chapter 2: County Level Data, Table 1. County Summary Highlights: 2012. USDA Census of Agriculture. https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Florida/st12_2_001_001.pdf

Table 6: Farm Statistics from the USDA Census of Agriculture

Farm Statistics for Lee County (2012)	
Number of Farms	844
Estimated market value of land and buildings: Average per farm	$979,161
Estimated market value of all machinery and equipment	$45,487,000
Market value of agricultural products sold	$105,903,000
……Average per farm	$125,478
Net cash farm income of operation	$28,214,000
……Average per farm	$33,429

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined animal/plant disease outbreaks to be a low priority hazard in Lee County. As described in the profile above, animal/plant disease outbreaks within the county are frequent events with an annual probability between 0.5 and 1. Animal/plant disease outbreaks have a low range of impact, accounting for less than $50,000 in annual damages. The probable hazard magnitude for animal/plant disease outbreaks is low, including no deaths or injuries recorded, and more than three days warning time before an event. *Table 7* outlines the hazard rankings for each of the hazard priority criteria related to animal/plant disease outbreaks.

Table 7: Animal/Plant Disease Outbreaks Hazard Priority

		Probable Hazard Magnitude		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
Medium Frequent events with annual probability between 0.5 and 1	Low Annual Damages less than $50,000	Low No deaths or injuries recorded	Low Three days or more	Low

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

From the Lee County government website, the County found that there were around 4,282 species of ferns and plant seeds. From the total species of ferns and plants, 1,412 are considered to be exotic. Eleven (11) percent of those 1,412 exotic plants are considered to be invasive which would amount to about 156 invasive species[6]. This is about 3.6% of the total number of species within Lee County. These are considered to be the greatest threat to the natural species, with urban sprawl being the second greatest.

Using data from the GIS portion of Lee County's website[7], the land uses were analyzed and considered for the impact estimate analysis of exotic plants. Areas that were labeled as Conservation Lands Upland, Conservation Lands Wetland, Density Reduction/ Groundwater Resource, Open Lands, Outer Islands, Rural Community Preserve, and Wetlands were considered as Natural Areas. Then using Census 2010 tract block value, the natural areas were

[6] Invasive Plants. Lee County Southwest Florida. http://www.leegov.com/conservation2020/landmanagement/invasive-plants

[7] FGDL Metadata Explorer: Search & Download Data. http://www.fgdl.org/metadataexplorer/explorer.jsp

given property based on the proportion of area within each tract. These were then summed to quantify the value of the natural areas. Because 3.65 % of species are considered invasive, that was used to quantify the potential annual impact that the pest species may have. The estimates of this analysis are list in the table below, with the estimated annual impact of around 278 thousand dollars. *Table 8* shows the summary of this analysis.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Table 8: Exotic Pests Damage Estimate

Parameter	Values
Natural Areas Land Value	$7,619,326
Total Seed Species	4282
Percent Not Natural	33%
Total Exotic Species	1412
Percent Pest	11%
Total Exotic Pests	156
Percent Pest of Total	3.64%
Natural Area Value Affected by Pest Species	$278,000

Coastal Erosion

Description

Coastal erosion is the landward displacement of the shoreline caused by the forces of waves and currents. The Bureau of Beaches and Coastal Systems defines a critically eroded area as:

A segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost. Critically eroded areas may also include peripheral segments or gaps between identified critically eroded areas which, although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects.

It is important to note that for an erosion problem area to be labeled "critical" there must exist a threat to or loss of one of four specific interests – upland development, recreation, wildlife habitat, or important cultural resources. Many areas have significant historical or contemporary erosion conditions, yet the erosion processes do not currently threaten public or private interests. These areas are therefore designated as noncritical eroded areas but require close monitoring as conditions change.

Beach erosion threatens the very resource that residents and visitors enjoy. Over 485 miles, or approximately 59% of the Florida's beaches experience erosion. At present, about 387 of the Florida's 825 miles of sandy beaches have experienced "critical erosion", a level of erosion which threatens substantial development, recreational, cultural, or environmental interests. While some of this erosion is due to natural forces and imprudent coastal development, a significant amount of coastal erosion in Florida is directly attributable to the construction and maintenance of navigation inlets. Florida has more than 60 inlets many of which have been artificially deepened to accommodate commercial and recreational vessels and employ jetties to prevent sand from filling in the channels. A by-product of

this practice is that the jetties and the inlet channels have interrupted the natural flow of sand along the beach causing an accumulation of sand in the inlet channel and at the jetty on one side of the inlet, and a loss of sand to the beaches on the other side of the inlet.[8]

Coastal erosion is one of the biggest problems Lee County's beaches face. Aside from the potential tourism dollars that may be lost, there are people's homes and businesses that could potentially be damaged from coastal erosion. Lee County invests in coastal preservation to counteract this threat to personal property, local quality of life and the economic benefit of tourism.

Location and Extent

As displayed in *Figure 3*, there are eleven critically eroded beach areas (22.4 miles), four non-critically eroded beach areas (5.3 miles), three critically eroded inlet shoreline areas (0.6 mile), and two non-critically eroded inlet shoreline areas (0.4 mile) in Lee County.[9]

The southern 4.0 miles of Gasparilla Island (R7-R26.7) is critically eroded threatening development and recreational interests in the town of Boca Grande and the Gasparilla Island State Park. Much of this area has bulkheads, and inlet sand transfer has been conducted using Boca Grande Pass dredge material. The north shoreline of Boca Grande Pass within the Gasparilla Island State Park (0.2 mile) is also critically eroded.

Three areas on Cayo Costa Island are non-critically eroded. The northern segment (R27-R33) extends for 1.1 miles, the central segment (R46-R52) extends for 1.2 miles, and the southern segment (R60-R65) extends for 1.0 mile.

All of North Captiva Island is eroded. The north shore fronting on Captiva Pass (R66, east 1000 feet) has critical inlet shoreline erosion threatening development interests. The northern 1.0-mile of gulf beach (R66-R71) is critically eroded threatening development interests, and from R71through R78 is 2.0 miles of non-critical erosion. The island was breached between R78 and R79 during Hurricane Charley (2004). The truncated southern 0.8 mile of North Captiva Island extending into Redfish Pass (R79-R82.3) is critically eroded threatening development and losing wildlife habitat.

All of Captiva Island is critically eroded. The south shore of Redfish Pass (R83-R84) has 0.2 mile of critically eroded inlet shoreline. This shoreline has a rock revetment with a terminal groin. The gulf beach from R84 through R109 has five miles that is critically eroded. This entire island segment is a beach restoration project.

Northern Sanibel Island is eroded. From R109 to R118 the beach is critically eroded, extending 1.7 miles south of Blind Pass where the road, development, recreation, and wildlife habitat are threatened. Part of this segment received nourishment from the Captiva Island beach restoration project. Another segment (R129-R133) on northern Sanibel Island has 0.9 mile that is critically eroded threatening development interests. This segment in the neighborhoods of Gulf Shores and Gulf Pines has a beach restoration project.

Most of Estero Island is eroded. From R175 (-.4) to R200, Ft. Myers Beach has 5.0 miles that is critically eroded threatening development and recreational interests. This entire segment is a beach restoration project. Matanzas

[8] Florida Department of Environmental Protection Beach Management Program Funding Assistance http://www.dep.state.fl.us/BEACHES/programs/becp/index.htm

[9] All of the information in the "Location and Extent" section is derived from the Florida Department of Environmental Protection's report "Critically Eroded Beaches in Florida": https://www.dep.state.fl.us/beaches/publications/pdf/CriticalErosionReport.pdf Lee County specific information last updated June 2014.

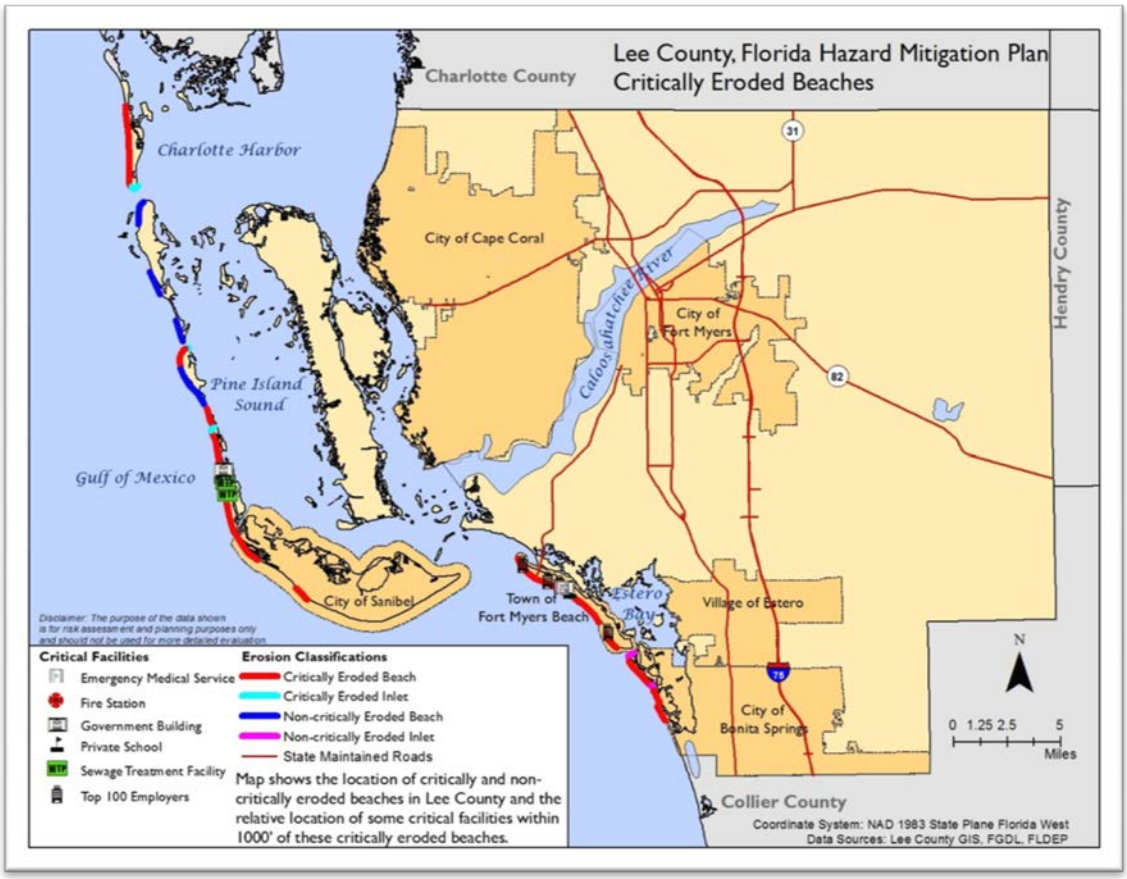
Pass channel dredge material has been previously placed at the north end on Bowditch Point. A 0.8-mile southern segment of Estero Island (R203-R207) is also critically eroded along the Little Estero Island Critical Wildlife Area. During the 1970's a subaerial portion of the Big Carlos Pass ebb tidal shoal migrated landward and attached to southern Estero Island entrapping an alongshore lagoon. This barrier continued to migrate landward through storm tide overtopping events and has gradually disintegrated through erosion, which threatens development, infrastructure, and wildlife habitat.

Most of Lover's Key is eroded. The north shore of Lover's Key (R211-R213) fronting on Big Carlos Pass has 0.3 mile that is a noncritical eroded. Most of the gulf beach extending from R214 to R222 has 1.5 miles that is critically eroded threatening recreational interests and wildlife habitat in Lover's Key State Park. A beach restoration project was constructed in 2004. The south shore of Lover's Key (R222) fronting on New Pass also has 0.1 mile of non-critically eroded inlet shoreline.

Between New Pass and Big Hickory Pass, Big Hickory Island (R222.7-R225.9) has 0.8 mile that is critically eroded where wildlife habitat and recreation has been lost. South of Big Hickory Pass, Little Hickory Island (R226-R230) has 0.9 mile of critically eroded beach threatening development interests in Bonita Beach. This area has a beach restoration project with bulkheads and two terminal groins at the north end.

All of these critically eroded beaches are at risk to coastal erosion. Significant storm events would cause tens of millions of dollars in damages to these areas of Lee County.

Figure 3: Critically eroded shoreline within Lee County



Previous Occurrences

According to the NOAA NCEI Storm Events Database, there are six coastal erosion events summarized below that occurred between October of 1995 and February 2010 in Lee County:

June 25, 2012 Tropical Storm Debby: In Lee County, the highest storm total rainfall reported was 4.95 inches at the Cape Coral CoCoRaHS station. The county suffered $2.3 million in damage to beaches, mostly on Captiva Island and Sanibel, while another $300 thousand in damage to homes was recorded. The tide gauge at Fort Myers measured a peak tide of 3.98 feet MLLW on afternoon of the 25th. Subtracting the predicted astronomical tide, the highest storm surge was calculated as 3.09 feet on the afternoon of the 25th. Lighthouse Road in Sanibel suffered erosion and was closed by Sanibel Police on the morning of the 25th.

July 10, 2005 Hurricane Dennis: A bubble of storm surge from Hurricane Dennis moved north along the west Florida Gulf Coast during the day. In Lee County, storm surge was reported at Fort Myers as 3.08 feet at 3:36 AM EDT, Storm Tide 3.20 feet at 4:54 AM EDT. The area reported minor beach erosion.

August 13, 2004 Hurricane Charley: Hurricane Charley made landfall just north of Captiva as a Category 4 storm with sustained winds estimated at 145 mph. The center of Charley crossed the barrier islands of Cayo Costa and Gasparilla Island at 345 PM EDT. The storm produced an eight to nine-foot storm surge in Lee County. The storm

surge created a new pass 300 yards wide across North Captiva Island. The storm surge was estimated at 4 to 6 feet at Fort Myers Beach, Horseshoe Key, and Port Boca Grande. Beach Erosion was documented on all Lee County coastal barrier islands (Gasparilla Island, Cayo Costa, North Captive Island, Captiva Island, Sanibel Island, Estero Island, Lovers Key, Big Hickory Island and Little Hickory Island. It ranges from major (North Captive, Captiva, Sanibel, Estero, Lovers Key, and Big Hickory) to minor erosion damage (Gasparilla, parts of Sanibel, and Little Hickory). In southwest Florida, 1.1 mile of critically eroded beach was added to Lee County due to the impact of Hurricane Charley.

September 17, 2000 Hurricane Gordon: Hurricane Gordon produced maximum storm tides above mean sea level of 2 to 4 feet in Lee County. These storm tides caused minor beach erosion in the county. More severe beach erosion was experienced to the north in Sarasota County.

September 20, 1999 Tropical Storm Harvey: Minor beach erosion occurred from Siesta Key in Sarasota County south across Manasota Key in Charlotte County and continued to Sanibel Island in Lee County. Several hundred feet of Blind Pass Road along the extreme southern tip of Siesta Key was washed away by high waves and flood waters.

October 4, 1995 Hurricane Opal: Major beach erosion was reported along the beaches of Lee and Sarasota Counties, considerable beach erosion occurred in Pinellas County, and minor erosion occurred in Manatee and Charlotte Counties.

Probability of Future Events

Coastal erosion is an ongoing natural process. Therefore, the probability of occurrence is high, with at least one event expected annually. Wind and flooding events caused by coastal storms increase the magnitude of coastal erosion.

Using historical records, it can be estimated that Lee County will experience at least 0.15 coastal erosion events every year (*Table 11*). No damages to property or crops are expected from these events annually.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined coastal erosion to be a low priority hazard in Lee County. As described in the profile above, coastal erosion events within the county are common events with an annual probability greater than 1.0. Coastal erosion events have a low range of impact, accounting for less than $50,000 in annual damages. The probable hazard magnitude for coastal erosion is low, including no deaths or injuries recorded, and more than three days warning time before the event.

Table 9 outlines the hazard rankings for each of the hazard priority criteria related to coastal erosion.

Table 9: Coastal Erosion Hazard Priority

Probability	Maximum Impact	Probable Hazard Magnitude: Death and Injury	Probable Hazard Magnitude: Warning Time	Composite Hazard Index
High Common events with annual probability > 1.0	Low Annual Damages less than $50,000	Low No deaths or injuries recorded	Low Three days or more	Low

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

Lee County's beaches are its number one economic and environmental asset. Continued erosion will have a variety of impacts on the county including a decrease in the tax base, public access, recreational opportunities, economic value, land value and damage to public infrastructure. Private property could be damaged by increased flooding and private land could be completely lost to the ocean.

Over the next 60 years, erosion may claim 1 out of 4 houses within 500 feet of the US shoreline.[10] This statistic helps form the basis of the 60-year Coastal Erosion Hazard Area. The 60-year Coastal Erosion Hazard Area represents the land expected to be lost to coastal erosion over the next 60 years. The Evaluation of Erosion Hazards Study prepared for FEMA by the H. John Heinz III Center for Science, Economics, and the Environment establishes this zone as land within 500 feet from the coastline. Any structure located within 500 feet of the shoreline is considered to be vulnerable.

Table 10 summarizes the number of critical facilities in Lee County that are within 1000 feet of critically and non-critically eroded beaches and inlets. It is important to note that of the total 1478 critically facilities identified in Lee County, only 1.3% are within 1000 feet of an eroded beach (both critical and non-critical). Only small sections of the Unincorporated County, the City of Sanibel, and the Town of Fort Myers Beach are exposed to this hazard.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

[10] The Heinz Center "Evaluation of Erosion Hazards", April 2000. https://www.fema.gov/pdf/library/erosion.pdf

Table 10: Critical Facilities within 1000 feet of Eroded Beaches in Lee County

Locality	Building Type	Building Count
Town of Fort Myers Beach	Emergency Medical Service	1
	Fire Station	1
	Gas Station	4
	Government Building	1
	Hazardous Material Site	1
	Private School	1
	Supermarket	1
	Top 100 Employers	4
Unincorporated	Government Building	1
	Sewage Treatment Facility	3
	Top 100 Employers	1

The NCEI Storm Events data was annualized by taking the total number of damaging coastal erosion events and dividing by the length of record. The annualized values should only be utilized as an estimate of what can be expected in a given year. *Table 11* shows the annualized results for coastal erosion events in Lee County.

Table 11: Annualized Damages from Coastal Erosion Events

Annualized Events	Annualized Property Damage	Annualized Crop Damage
0.150	$0.00	$0.00

Drought/Extreme Heat

Description

A drought is a period in which an unusual scarcity of rain causes a serious hydrological imbalance in which water supply reservoirs empty, water wells dry up, and crop damage ensues. A prolonged period of drought may or may not accompany the periods of extreme heat.

There are four main classifications of droughts. They include (1) Meteorological, (2) Agricultural, (3) Hydrological, and (4) Socio-economic. Meteorological droughts are typically defined by the level of "dryness" when compared to an average, or normal, amount of precipitation over a given period of time. Agricultural droughts relate common characteristics of drought to their specific agricultural-related impacts. Emphasis tends to be placed on factors such as soil/water deficits, water needs based on differing stages of crop development, and water reservoir levels. Hydrological drought is directly related to the effect of precipitation shortfalls on surface and groundwater supplies. Human factors, particularly changes in land use, can alter the hydrologic characteristics of a basin. Socio-economic drought is the result of water shortages that limit the ability to supply water-dependent products in the marketplace.

Extreme heat is a summer phenomenon that usually involves temperatures over 100°F for a period of several days. The NWS can issue heat-related messages to inform citizens of forecasted extreme heat conditions. These messages are based on projected or observed heat index values and include:

- Excessive Heat Outlook: When there is a potential for an excessive heat event within three to seven days;
- Excessive Heat Watch: When conditions are favorable for an excessive heat event within 12 to 48 hours but some uncertainty exists in regards to occurrence and timing; and
- Excessive Heat Warning / Advisory: When an excessive heat event is expected within 36 hours. These messages are usually issued when confidence is high that the event will occur. A warning implies that conditions could pose a threat to life or property, while an advisory is issued for less serious conditions that may cause discomfort or inconvenience, but could threaten property if caution is not taken.

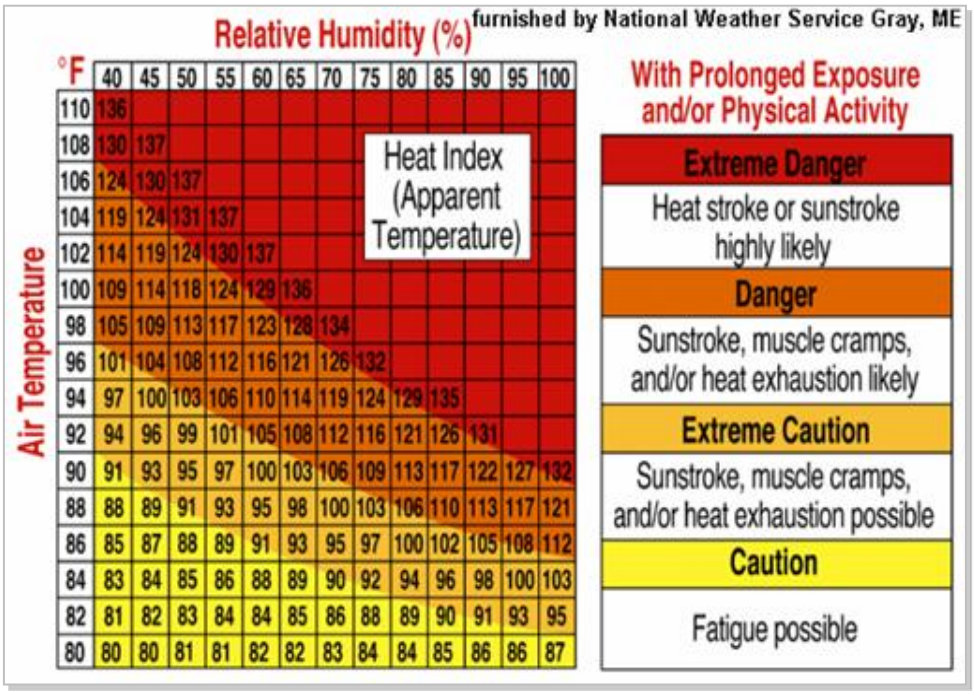
Several indices are available to determine drought stages; two of which are the Palmer Drought Severity Index (PDSI) and the Keetch-Bryam Drought Index (KBDI). The PDSI uses precipitation, air temperature, soil moisture, evapotranspiration, and previous indices to produce a number indicating current conditions. The KBDI monitors fire danger and severity using maximum daily temperature, daily, antecedent, and annual precipitation.

Location and Extent

In Southwest Florida, drought is primarily a late winter occurrence. Its greatest impact is on agricultural production, with secondary impacts on public water supplies. In addition to agricultural damage and shortages of drinking water, environmental damage and a shortage of water needed for utilities and firefighting may occur. The entirety of Lee County has the potential to be impacted by drought and extreme heat.

The “heat index” or “apparent temperature” is often used to measure how hot the air “feels” based on temperature and humidity. The index can be used as an indicator of potential health effects.

Figure 4: NWS Heat Index Chart



Droughts can last a few months to several years. Longer droughts can increase wildfire risk and impact municipal water availability. The severity of a drought may be gauged by the size of the area affected, the duration, and the

degree of moisture deficiency. Droughts may result in reduction of electric power generation and water quality deterioration. Drought conditions can also cause soil to compact, decreasing its ability to absorb water, making an area more susceptible to flash flooding and erosion. A drought may also increase the speed at which dead and fallen trees dry out and become more potent fuel sources for wildfires. Drought may also weaken trees in areas already affected by infestations, causing more extensive damage to trees and increasing wildfire risk, at least temporarily.

Risks from exposure to extreme heat include sunburn, heat cramps, heat exhaustion, heat stroke, and death. Extreme heat is also hazardous to livestock, agriculture, and structures such as roads and bridges, and may diminish water and energy supplies, which may increase the risk to human health.

Previous Occurrences

Extreme heat events have normally occurred in early summer. The impact of these events can affect the local population, tourism industry, and agricultural industry. The NOAA NCEI Storm Events Database has recorded four occurrences of extreme heat events in Lee County since 1998, with three in June 1998 and a fourth in June 2009. Temperatures in these events increased to above 100 degrees.

Probability of Future Events

As of January 2017, the Palmer Drought Severity Index categorized the region in a "moderate drought." Using historical records, it can be estimated that Lee County will experience at least one drought every two to three years (low rank).

It is somewhat likely that Lee County could have another drought or extreme heat event. Extreme heat events can occur simultaneously with drought, but either can occur without the other. While extreme heat events can cause death to any person of any age, the elderly, very young, and mobility restricted are considered the most at risk.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined drought and extreme heat to be a low priority hazard in Lee County. As described in the profile above, drought and extreme heat events within the county are infrequent events with an annual probability of less than 0.5. Drought and extreme heat events have a low range of impact, accounting for less than $50,000 in annual damages. The probable hazard magnitude for drought and extreme heat ranges from low to high, including some deaths and injuries reported, and more than a three-day warning time before the event. Table 12 outlines the hazard rankings for each of the hazard priority criteria related to drought and extreme heat.

Table 12: Drought and Extreme Heat Hazard Priority

		Probable Hazard Magnitude		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
Low Infrequent events with annual probability < 0.5	Low Annual Damages less than $50,000	High Deaths and Injuries reported	Low Three days or more	Low

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

The most common form of drought affects the agricultural industry usually for six or more months with less than 75% normal precipitation. The residential and commercial areas can also be affected depending on their water sources. Wildfires can be more likely to occur and more difficult to fight it water is scarce.

Agricultural assets are most at risk in the county. According to the 2012 Census of Agriculture, the value of crops sold from Lee County was $101,469,000 with livestock sales valued at $4,434,000. There are 844 farms on 87,125 acres in the county.

The drought and extreme heat events from the NOAA NCEI Storm Events Database were annualized by taking the total number of damaging drought events and dividing by the length of record. The annualized values should only be utilized as an estimate of what can be expected in a given year. Using historical records, it can be estimated that Lee County will experience at least 0.21 events every year. Damages from these events can be expected in the magnitude of $0 for property and $0 for crop damages annually. *Table 13* shows the annualized results for drought events in Lee County. The value is noted as zero based on some droughts causing limited or no damage and data often not being reported to NOAA.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Table 13: Annualized Damages from Drought Events

Annualized Events	Annualized Property Damage	Annualized Crop Damages
0.21	$0	$0

Epidemic/Pandemic Diseases

Description

An ***epidemic*** is a disease that affects a greater number of people than is usual within a region. A ***pandemic*** is the same as an epidemic except it has spread to more than one region of the world. Infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi; the diseases can be spread, directly or indirectly, from one person to another. Zoonotic diseases are infectious diseases of animals that can cause disease when transmitted to humans.

For the purpose of this Plan, infectious disease has been categorized as (1) pandemic and (2) localized infectious disease outbreaks.

A pandemic is an epidemic that occurs over a wide geographic area, often global. Pandemics results when a microorganism (or disease condition) emerges that is pathogenic for humans but to which humans have no immunity or prior protection. Thus, an epidemic occurs and the number of cases substantially exceeds the number of expected cases over a given period of time. Pandemics generally refer to infectious diseases that spread efficiently from person to person across the globe, although the term may be used to describe medical conditions with other risk factors, such as chronic illnesses like cardiovascular diseases.

The Department of Homeland Security defines pandemic influenza as "a virulent human flu that causes a global outbreak, or pandemic, of serious illness."[11] Though it is fundamentally a medical event, a pandemic has the potential to affect people and industries around the world.[12] At a minimum, pandemic influenza could kill between 2 and 7.4 million people globally and infect tens of millions more.[13]

The extent and severity of a pandemic depends on the specific characteristics of the infectious disease[14]. Based on previous events, however, certain assumptions about the characteristics and effects of a pandemic have been made, including:

- Universal susceptibility to the pathogenic microorganism
- Infection rate of 30 percent of the overall population, including about 40 percent of school-aged children and 20 percent of working adults
- Worker absenteeism rate of up to 40 percent during peak infection times due to illness, the need to care for ill family members, and fear of infection
- Epidemic periods of 6 to 8 weeks in affected communities
- Waves (periods during which community outbreaks occur across the country) of 2 to 3 months15.

An infectious disease outbreak is unpredictable in every aspect, and could cause social and economic catastrophe. For instance, influenza viruses evolve easily and unpredictably through genetic mutation and interaction with other viruses. As a result, new influenza subtypes continually emerge, though most only affect birds and pigs. There are 3 types of influenza viruses: A, B, and C. Human influenza A and B viruses cause seasonal epidemics of disease almost every winter in the United States; scientists believe that the influenza A virus is the only one capable of causing a pandemic. Influenza type C infections cause a mild respiratory illness and are not thought to cause epidemics. A pandemic could be triggered by a subtype of Influenza A that has not previously circulated in humans, or by a strain that has progressively adapted to become more capable of being passed easily among humans. Though both circumstances are rare events, experts believe the development of such a subtype is inevitable.[16,17]

It is impossible to determine the exact circumstances in which an influenza virus will evolve into a pandemic. In one possible scenario, clusters of respiratory illness will appear from one region, indicating transmission between humans. Once cases begin to be identified as a new influenza strain, the disease may spread rapidly to family members, health care workers, and the general population. Next, dozens of cases will be reported in a single day, followed by hundreds. If the pandemic is not stopped, it could spread globally within 3 months[18].

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[11] Pandemic Influenza: Preparedness, Response, and Recovery. US Department of Homeland Security. www.pandemicflu.gov/plan/pdf/cikrpandemicinfluenzaguide.pdf

[12] HHS Pandemic Influenza Plan. US Department of Health and Human Services, 2005. www.hhs.gov/pandemicflu/plan/

[13] WHO Outbreak Communication. World Health Organization, December 2005. www.who.int/csr/don/Handbook_influenza_pandemic_dec05.pdf

[14] HHS Pandemic Influenza Plan. US Department of Health and Human Services, 2005. www.hhs.gov/pandemicflu/plan/

[15] Pandemic Influenza: Preparedness, Response, and Recovery. US Department of Homeland Security. www.pandemicflu.gov/plan/pdf/cikrpandemicinfluenzaguide.pdf

[16] WHO Outbreak Communication. World Health Organization, December 2005. www.who.int/csr/don/Handbook_influenza_pandemic_dec05.pdf

[17] Types of Influenza Viruses. Centers for Disease Control and Prevention, http://www.cdc.gov/flu/about/viruses/types.htm

[18] WHO Outbreak Communication. World Health Organization, December 2005. www.who.int/csr/don/Handbook_influenza_pandemic_dec05.pdf

A localized infectious disease outbreak is a sudden rise in the occurrence of a disease. Some outbreaks are expected each year, like influenza, or other respiratory or gastrointestinal diseases. Such infectious disease outbreaks can be foodborne, waterborne, vector-borne, environmental, or transmitted person-to-person[19].

The 2014 Ebola Virus Disease (Ebola) outbreak primarily affected countries in West Africa, though Ebola cases were diagnosed in the United States and other countries. The Florida Department of Health in Lee County monitored the situation and worked closely with community and state partners in preparing for and responding to situations that might be related to Ebola[20].

Middle East Respiratory Syndrome (MERS) is viral respiratory illness first reported in Saudi Arabia in 2012. It is caused by a coronavirus called MERS-CoV. Most people who have been confirmed to have a MERS-CoV infection developed severe acute respiratory illness. They had fever, cough, and shortness of breath. About 30 percent of these people died. All the cases have been linked to 6 countries in or near the Arabian Peninsula. CDC continues to closely monitor the MERS-CoV situation globally and work with partners to better understand the risks of this virus, including the source, how it spreads, and how infections might be prevented. The risk to the public is low.

The H5N1 or avian influenza, was first detected in Guangdong, China in 1996 and has since been found in birds in numerous countries throughout Africa, Asia, and Europe[21]. Asian H5N1 was first detected in humans in 1997 during a poultry outbreak in Hong Kong and has since been detected in poultry and wild birds in more than 50 countries in Africa, Asia, Europe, and the Middle East. Six countries are considered endemic for Asian H5N1 (Bangladesh, China, Egypt, India, Indonesia, and Vietnam). H5N1 is the most likely cause of a potential pandemic, though it is not the only possible cause.[22]

Zika, a mosquito-borne virus, has been identified in Central and South America, Mexico, and the Caribbean since 2015. Local transmission of Zika was reported in Florida and Puerto Rico in 2016. Zika virus has been linked to serious birth defects infants and children when contracted by women during pregnancy. The Florida Department of Health and CDC continue intensive efforts to increase response capabilities, as Zika will continue to be threat to Florida travelers and the likelihood of local transmission returning to Florida remains high.

Location and Extent

According to the Center for Disease Control and Prevention (CDC), the state of Florida will most likely experience epidemics common to the United States such as HIV/AIDS, other STDs, Tuberculosis, and Hepatitis A, B, and C (HAV, HBV, HCV). Depending on the scale of outbreak and type of disease, an infectious disease outbreak could impact Lee County significantly. The impact of an outbreak in Lee County would most likely be catastrophic. As residents and workers became infected, employee absenteeism would increase, and the length of time necessary to recoup and regain lost time and money could last 6 months or longer.

[19] Monterey Bay Flu Watch. http://cns.miis.edu/flu_watch/history.htm

[20] "Lee Memorial training staff on treating Ebola." http://www.nbc-2.com/story/26775159/lee-memorial-training-staff-on-treating-ebola

[21] The Prioritization of Critical Infrastructure for a Pandemic Outbreak in the United States Working Group Final Report. National Infrastructure Advisory Council. 16 January 2007.

[22] CDC Highly Pathogenic Asian Avian Influenza. August 2015.

Areas with high population density are most vulnerable to the spread of an influenza virus. Other parts of the county with lower densities are not as susceptible to an outbreak; however, the virus can still spread in schools and workplaces.

Previous Occurrences

Although a pandemic outbreak has not occurred in Lee County, outbreaks have occurred in other places around the world and throughout history. Any outbreak in the country has the potential to affect Lee County.

Three pandemics struck in the 20th century:

- The "Spanish Flu" of 1918 killed more people in 1 year than the 14th Century "Black Death" killed in its entire 4-year run. The Spanish Flu infected 500 million people worldwide and killed an estimated 40 million people—as much as 40 percent of the earth's 1918 population. This figure exceeds the death toll of World War I.[23]
- The "Asian Flu" of 1957 killed approximately 70,000 Americans and between 1 and 4 million people worldwide. The virus first appeared in 1957, but reappeared as a second wave in America's elderly community in 1958.[24]
- The "Hong Kong Flu" killed approximately 34,000 Americans and 700,000 people worldwide in 1968. Experts believe that medical advances and lessons learned from the 1957 pandemic helped to keep the death toll lower than previous events[25].

In the 21st century, there has been one pandemic outbreak:

- On June 11th, 2009, the World Health Organization (WHO) declared the 2009 H1N1 outbreak a global pandemic. The 2009 H1N1 was first detected in the US in April 2009. This virus was a combination of influenza virus genes not previously identified in either animals or people. The Food and Drug Administration (FDA) announced its approval of the first H1N1 vaccines in September. The H1N1 virus was not as severe as the WHO initially thought, nor severe as the 20th century pandemics. Critics claimed the WHO had exaggerated the danger of this virus. Based on more recent research, the WHO now estimates 284,500 people were killed by the disease, primarily in Africa and Southeast Asia26.

No instances of major localized disease outbreak have been reported in Lee County. Other historical non-Lee County major localized disease outbreak incidents include:

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[23] The Prioritization of Critical Infrastructure for a Pandemic Outbreak in the United States Working Group Final Report. National Infrastructure Advisory Council. 16 January 2007. www.dhs.gov/xlibrary/assets/niac/niac-pandemic-wg_v8-011707.pdf

[24] The Prioritization of Critical Infrastructure for a Pandemic Outbreak in the United States Working Group Final Report. National Infrastructure Advisory Council. 16 January 2007. www.dhs.gov/xlibrary/assets/niac/niac-pandemic-wg_v8-011707.pdf

[25] Monterey Bay Flu Watch. http://cns.miis.edu/flu_watch/history.htm

[26] Dawood FS, Iuliano AD, Reed C et al. (September 2012). "Estimated global mortality associated with the first 12 months of 2009 pandemic influenza A H1N1 virus circulation: a modelling study". Lancet Infect Dis 12 (9): 687–95. doi:10.1016/S1473-3099(12)70121-4. PMID 22738893 and Goodenough, T. (26 June 2012). "Swine flu killed 250,000 - 15 TIMES the number of people reported, claims international study". Mail Online. Retrieved 3 July 2012.

- The 2014 Ebola outbreak is the largest Ebola outbreak in history and is the first Ebola epidemic in world history. As of July 2015, there were more than 27,952 cases and 11,284 deaths[27]. There have been 368 Ebola contact-tracing cases in the United States since October 2014 in Texas, Ohio, and New York. In September and October 2014, there were 4 confirmed Ebola diagnoses in the U.S. One patient, who had traveled to Dallas, Texas from Liberia, died. Two healthcare workers who came into contact with that patient were treated and recovered. The 4th confirmed case was a medical aid worker who had returned from Guinea, who was treated in New York City and later discharged[28].
- A strain of bird flu, scientifically known as Highly Pathogenic Avian Influenza (HPAI) H5 virus, entered the Pacific Northwest in December 2014 by migratory waterfowl. As of July 2015, there were 223 reported cases of HPAI in domestic flocks in 15 states.[29] HPAI virus has not been identified in Florida birds as of February 2017, and would be expected to be seen in more northerly states first, but identifications are possible.
- In May 2014, the CDC confirmed 2 unlinked imported cases of MERS in the U.S. Both cases were healthcare providers who lived and worked in Saudi Arabia, 1 in Indiana and the other in Florida. Both patients were hospitalized in the U.S. and made full recoveries. MERS represents a low risk to the public in the U.S.
- In January 2014, Canada reported the first human infection of H5N1 virus in the Americas. The patient was a traveler who had recently returned from China. To date there have been no reports of H5N1 infections of birds or humans in the US.
- There have been 24 confirmed cases of bovine spongiform encephalopathy (BSE) ("mad cow disease") in North America from 1993 through February 2015[30]. Twenty of the cases were in Canada and 4 in the U.S. Between 1996 and 2014, there were 4 U.S. cases of Variant Creutzfeldt-Jakob Disease (vCJD)[31]. Millions of cattle have been destroyed on suspicion of contracting mad cow disease, costing billions of dollars. National milk producers have worked on plans for limiting milk movement.
- Since 1970, several versions of leaf blight have destroyed over 10 million acres and $1 billion in crops.
- In 1996, a small outbreak of a fungal disease called Karnal Bunt occurred in wheat seeds in Arizona. As a result, more than 50 countries restricted trade with the U.S. The total cost of clean-up was around $45 million, and the reduction in exports cost $250 million[32].
- In 1983, highly pathogenic avian influenza struck Pennsylvania. About 17 million chickens were disposed of, costing $86 million. The price of poultry increased, costing consumers $548 million, and an additional $7 million in wages were lost.

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[27] CDC Ebola Chorological Dates of Ebola. August 2015.

[28] Centers for Disease Control and Prevention. Cases of Ebola diagnosed in the United States. August 2015.

[29] Update on the Highly-Pathogenic Avian Influenza Outbreak of 2014-2015. July 20, 2015. https://fas.org/sgp/crs/misc/R44114.pdf

[30] Centers for Disease Control and Prevention. BSE in North America. http://www.cdc.gov/prions/bse/bse-north-america.html August 2015.

[31] Centers for Disease Control and Prevention. Variant Creutzfedt-Jakob Disease. http://www.cdc.gov/prions/vcjd/index.html August 2015.

[32] Kohnen, Anne. Responding to the Threat of Agroterrorism: Specific Recommendations for the United States Department of Agriculture. October 2000.

Probability of Future Events

Lee County is likely to see future events, with historical data suggesting that the county has an annual probability estimated between 0.5 and 1 for epidemic diseases. These diseases can range from the yearly influenza to the rarer and even deadlier diseases such as Ebola.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined epidemic and pandemic diseases to be a medium priority hazard in Lee County. As described in the profile above, epidemic and pandemic disease events within the county are frequent events with annual probability between 0.5 and 1. epidemic and pandemic diseases events have a low range of impact, accounting for less than $50,000 in annual damages. The probable hazard magnitude for epidemic and pandemic diseases ranges from medium to high, with multiple deaths and injuries reported, and a one to two-day warning time before an event. *Table 14* outlines the hazard rankings for each of the hazard priority criteria related to epidemic and pandemic diseases.

Table 14. Epidemic and Pandemic Diseases Hazard Priority

Probability Score	Maximum Impact	Probable Hazard Magnitude: Death and Injury	Warning	Composite Hazard Index
Medium Frequent events with annual probability between 0.5 and 1	Low Annual Damages less than $50,000	High Deaths and Injuries reported	Medium 1 - 2 days	Medium

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

According to the Florida Department of Health: "The Department of Health has estimated that an influenza pandemic in Florida could result in up to 10 million persons infected, with 5 million chronically ill. An estimated 3 million persons may require outpatient care with an additional 71,000 hospitalizations and up to 18,000 deaths. Demands on health care services under these conditions would overwhelm the state's delivery system. Shifts in human and material resources that are normally executed during other natural disasters will not be possible since outbreaks are expected to occur simultaneously throughout much of the U.S." Assuming the same proportion of population in Lee County is susceptible to the flu, *Table 15* shows what could result in Lee County.

Table 15: Proportion of 2013 Population of Lee County Affected by Florida Influenza

Category	Population	Percent of total Population	Number of people affected
Florida Population[33]	19.6 million		
Florida Influenza Outbreak	10.0 million		
Florida Chronic Cases	5.0 million		

[33] Florida 2013 Population. https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=florida%20population

Category	Population	Percent of total Population	Number of people affected
Florida Outpatient Care	3.0 million		
Florida Hospitalizations	71,000		
Florida Deaths	18,000		
Lee County Population[34]	661,115		
Lee County Influenza Outbreak	337,304	51%	510 out of 1000 affected
Lee County Chronic Cases	168,652	25%	255 out of 1000 affected
Lee County Outpatient	101,191	15%	153 out of 1000 affected
Lee County Hospitalizations	2,395	0.36%	4 out of 1000 affected
Lee County Deaths	607	0.092%	1 out of 1000 affected

Similar epidemics and pandemics could influence the county greater or less depending on how severe the symptoms are. However, as influenza is the most common and happens on a yearly basis, this may be the best way to estimate what percent of the population could be influenced or affected.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Flood

Description

Flooding, the most frequent and costly natural hazard in the United States, has caused more than 10,000 deaths nationwide since 1900. Nearly 90% of presidential disaster declarations resulted from natural events where flooding was a major component.

The National Flood Insurance Program defines flooding as a general and temporary condition of partial or complete inundation of two or more acres of normally dry land by overflow of inland or tidal waters, unusual and rapid accumulation or runoff of surface waters from any source, or a mudflow.

Floods generally result from excessive precipitation. Manmade development may contribute to urban flooding by obstructing the natural flow of water and decreasing the ability of natural groundcover to absorb and retain surface water runoff. Floods may be classified as general floods – precipitation over a given river basin for a long period of time along with storm-induced wave or tidal action – and flash floods – the product of heavy localized precipitation in a short time period over a given location.

Riverine flooding occurs when a channel, like a river or a creek, receives more water than it can hold, and the excess water overflows the channel banks to flood the surrounding area. Coastal flooding[35] is typically a result of storm surge, wind-driven waves and heavy rainfall produced by hurricanes, tropical storms and other large coastal storms.

[34] Lee County 2013 Population. https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=lee%20county%20fl%20population

[35] While briefly mentioned here, coastal flooding is more thoroughly addressed under the "coastal flooding/storm surge" hazard.

The severity of a flooding event is typically determined by factors including stream and river basin topography and physical geography, precipitation and weather patterns, recent soil moisture conditions, and the degree of vegetative clearing and impervious surface.

The periodic flooding of lands adjacent to rivers, streams and shorelines (land known as floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Floodplains are designated by the frequency of the flood that is large enough to cover them. Within FEMA's designated Special Flood Hazard Area, there is a 1 percent chance of flooding in any given year. Outside the Special Flood Hazard Area, there is a 0.2 percent chance of flooding in any given year.

Location and Extent

The topography of Lee County is generally low and flat, with 35% of the developed area of the county at or below 10 feet NAVD[36]. Barrier islands with numerous inlets are particularly susceptible to tidal and coastal flooding from storm surge. Small dunes provide very little protection from wave action[37]. The largest drainage basin in Lee County is the Caloosahatchee River, a broad estuary that under certain conditions can experience storm surge generated at its mouth that intrudes far upstream.[38]

FEMA Flood Insurance Rate Maps (FIRMs) delineate the areas in Lee County that are in the Special Flood Hazard Area where there is a 1% annual change of flooding. The SFHA Zones include A/AE/AO/AH, areas subject to riverine inundation and Zone VE areas subject to coastal velocity wave action. FIRMs also delineate the area that has a 0.2-percent-annual-chance of as Zone X (shaded). Areas likely to have shallow, seasonal ponding are labeled Zone X (unshaded).[39] Flooding and flood-related losses do occur outside of delineated Special Flood Hazard Areas.

It is estimated that about 35% of the 814 square miles of land[40] within Lee County are located in the 100-year floodplain[41]. *Figure 5* illustrates the location and extent of the currently mapped flood zones in Lee County based on the effective FEMA Flood Insurance Study dated August 28, 2008.

[36] 2008 Countywide Flood Insurance Study, Lee County, FL

[37] Ibid

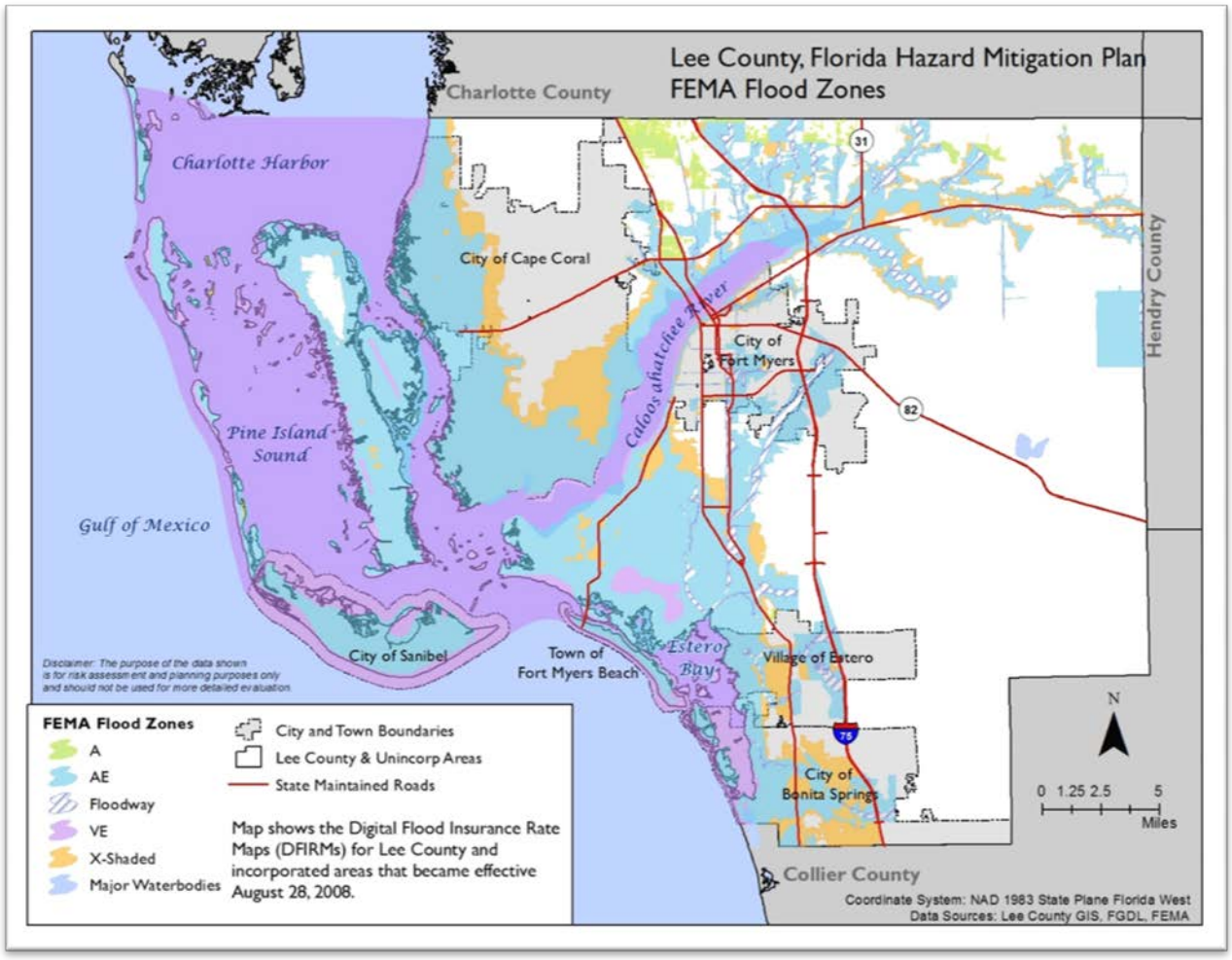
[38] Coastal Discovery Report, Lee County and Incorporated Areas, October 8, 2014.

[39] https://www.fema.gov/flood-zones

[40] Area calculated using Lee County's "County Boundary" shapefile from Lee County GIS Department http://www.leegov.com/gis/data

[41] From the effective FEMA FIRM for Lee County, FL (effective August 28, 2008): http://msc.fema.gov/portal

Figure 5: FEMA Flood Zones in Lee County, FL



Below is a summary of flooding "hot spots" within the county and jurisdictions.

In addition to building and infrastructure damage due to overland flooding there are numerous undersized culverts, low water crossings, and low capacity bridges throughout the County that cause flooding problems.

Previous Occurrences

Since 1964, 10 flood related events have resulted in Federal disaster declarations for Lee County. These events are shown in Table 16.

Table 16: Flood-Related Federal Disaster Declarations for Lee County, Florida

Disaster Number	Declaration Date	Event Title
1609	10/24/2005	Hurricane Wilma
1561	9/26/2004	Hurricane Jeanne
1551	9/16/2004	Hurricane Ivan

Disaster Number	Declaration Date	Event Title
1545	9/4/2004	Hurricane Frances
1539	8/13/2004	Tropical Storm Bonnie And Hurricane Charley
1393	9/28/2001	Severe Storms, Tornadoes and Flooding Associated with Tropical Storm Gabrielle
1069	10/4/1995	Hurricane Opal
337	6/23/1972	Tropical Storm Agnes
252	11/7/1968	Hurricane Gladys
209	9/14/1965	Hurricane Betsy

According to the NOAA NCEI Storm Events Database, there have been 29 reported flood events in Lee County since 1996. According to the data as shown in Table 17 there was over $2.8 million in property damage, no agricultural damage, and no deaths or injuries during this period.

Table 17: NCEI Historical Flood Event Data

Number of Flood Events	Total Property Damage	Total Agricultural Damage	Total Deaths (direct and indirect)	Total Injuries (direct and indirect)
29	$2,837,500	None Recorded	0	0

Limited detail is available on damages from the flooding events. It should be noted that NCEI takes the available total damage estimate from the event and, if multiple counties are involved (10 or more for some of the identified events), evenly spreads the damage across the counties. For that reason, the damage amounts are not indicative of future damage. Summaries of the events for which data were available are listed in *Table 18*.

Table 18: Notable Historic Flood Events

Location	Date	Type	Property Damage	Description
Bonita Springs and Estero	8/20/2008	Sheet Flow Flooding	$250,000 (roads) and $250,000 (homes)	Six to 14 inches associated with Tropical Storm Fay caused extensive sheet flow flooding from the Imperial River that runs through Bonita Springs. Flood damage was reported to numerous roads and homes with 500 residents, including the population of an RV park, evacuated to a shelter.
Bonita Springs	6/24/2003	Heavy Rainfall	$20,000	A RV Park in East Bonita Springs was evacuated as the area was inundated with four feet of water after heavy rains.
Fort Myers Beach and Lehigh Acres	10/4/2000	Heavy Rainfall	$200,000	Eight to 10 inches of rain fell in less than six hours, flooding roadways and low-lying areas from Lehigh Acres southwest to Fort Myers Beach. A few homes and several vehicles incurred water damage at low-lying roads and intersections.
Lee County (countywide)	9/17/2000	Heavy Rainfall	$250,000	Six to eight inches of rain associated with Hurricane Gordon fell in less than 18 hours. Several homes in low-lying and poor drainage areas and several vehicles were damaged, mainly at flooded intersections and low-lying roadways.
Bonita Springs	9/21/1999	Heavy Rainfall	$200,000	Four to seven inches of rain fell over the previously saturated soil of southern Lee County and flooded homes and businesses in low-lying areas along the U.S. Highway 41 corridor from Estero south to Bonita Springs.

Location	Date	Type	Property Damage	Description
North Fort Myers	7/1/1999	Heavy Rainfall	$150,000	Four to six inches of rain fell in less than three hours causing urban and small stream flooding along and east of I-75 from Port Charlotte in Charlotte County south to Lehigh Acres in Lee County. Four piglets drowned in North Fort Myers.
Cape Coral, Ft. Myers	9/27/1997	Flash Flooding	$200,000	Six to 10 inches of rain flooded roads, homes and businesses when rivers and streams overtopped.
Cape Coral	6/18/1999	Flash Flooding and Heavy Rainfall	$500,000	Six to eight inches of rain fell in less than three hours, flooded roadways, damaged carpets in nearly 50 homes and caused structural damage to an additional nine homes.

Historical Summary of Insured Flood Losses

The National Flood Insurance Program (NFIP) is federal program that enables property owners in participating communities to purchase insurance for flood losses. For a community to participate in the NFIP they must adopt floodplain management regulations that reduce future flood damages. This insurance is designed to provide an alternative to disaster assistance to reduce the high costs associated with repairing damage to buildings and their contents caused by floods (FEMA).

In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the nation's floodplains. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance.

Communities that participate in the NFIP are required to adopt and enforce the minimum federal NFIP floodplain management regulations. These regulations apply to all types of floodplain development and ensure that development activities will not cause an increase in future flood damages. To ensure that new construction is reasonably safe from flooding, the finished floor elevation must meet or be higher than the Base Flood Elevation (BFE) established by FEMA Flood Insurance Rate Maps and a community's Flood Insurance Study (FIS). These maps identify areas that have a 1%-annual chance of flooding as well as those areas with a 0.2%-annual chance of flooding. If there is a federally insured loan on the structure, like most mortgages, there is a mandatory requirement to purchase a flood insurance policy. The City of Bonita Springs, The City of Cape Coral, The City of Fort Myers, The Town of Fort Myers Beach, The City of Sanibel and unincorporated Lee County all participate in the National Flood insurance program and Community Rating System, which offers discounts on NFIP policies. In February 2015, the newly incorporated Village of Estero received its NFIP Identification Number and began the formal process of joining the NFIP and CRS.

Table 19 contains a summary of National Flood Insurance Program participation in Lee County and its incorporated communities. Participating communities in Lee County coordinate as a group to share information and best practices to remain in compliance with NFIP requirements. Jurisdictions meet on a regular basis as part of a Community Rating System (CRS) Users Group and also participate in the county's Multijurisdictional Program for Public Information.

Table 19. Lee County NFIP Participation

Community Name	Status	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date
Bonita Springs, City Of	Participating	N/A	09/19/84	08/28/08
Cape Coral, City Of	Participating	03/30/73	08/17/81	08/28/08
Estero, Village Of	Participating	N/A	09/19/84	08/28/08
Fort Myers Beach, Town Of	Participating	N/A	07/20/98	08/28/08
Fort Myers, City Of	Participating	10/30/70	11/15/84	08/28/08
Sanibel, City Of	Participating	07/23/76	04/16/79	08/28/08
Lee County Unincorporated Areas	Participating	09/19/84	09/19/84	08/28/08

Of the 132,050 flood insurance policies in force within the county, 74,989 are within the unincorporated county. As of January 2017, 9,274 NFIP claims with $75.7 million in total payments had been filed for properties within the county since 1978. *Table 20* summarizes the NFIP policy and claim statistics for the county with Florida totals for comparison. These losses include both inland (freshwater) and storm surge flooding events. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that additional flood losses in Lee County were either uninsured, denied claims payment, or not reported.

Table 20: Lee County NFIP Policies and Claims

Community Name	Number of Policies	Total Coverage	Total Premium	Total Claims Since 1978	Total Paid since 1978
Bonita Springs, City Of	8,041	$1,964,456,300	$4,886,585	13	$118,396
Cape Coral, City Of	31,669	$8,151,551,000	$22,214,070	765	$808,984
Estero, Village of[42]	N/A	N/A	N/A	N/A	N/A
Fort Myers Beach, Town Of	3,739	$793,052,900	$3,829,118	345	$6,341,842
Fort Myers, City Of	5,510	$1,446,614,000	$3,026,404	243	$1,526,847
Sanibel, City Of	8,102	$1,901,426,700	$9,505,725	1342	$7,464,158
Lee County Unincorporated Areas	74,989	$17,217,613,500	$50,183,807	6566	$59,486,559
Total:	132,050	$31,474,714,400	$93,645,709	9274	$75,746,786

Community Rating System (CRS)

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Thus, flood insurance premium rates are discounted to reflect the reduced flood risks. There are 10 CRS classes: Class 1 requires the most credit points and gives the largest flood insurance premium reduction; Class 10 receives no premium reduction. These discounts are applied per each CRS community and apply to all flood insurance policyholders. For CRS participating communities, flood insurance premium rates are discounted in

[42] Totals for the Village of Estero are reflected in the Lee County Unincorporated Areas totals.

increments of 5%; i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount.[43]

All communities in Lee County and the unincorporated area of Lee County, participate in the CRS program. See Table 21 for an overview of each community's class rating the date they entered the program. Participation in this program allows residents within the SFHA to receive a discount on their flood insurance premiums for policies purchased under the NFIP. Residents within the non-SFHA also receive a discount on their policies.

Table 21: Lee County CRS Participation

Community	Class Rating	Effective Date	SFHA Insurance Discount	Non-SFHA Insurance Discount
Bonita Springs, City Of	5	5/1/2017	25%	10%
Cape Coral, City Of	5	5/1/2010	25%	10%
Estero, Village of	N/A	N/A	N/A	N/A
Fort Myers Beach, Town Of	7	10/1/1999	15%	5%
Fort Myers, City Of	7	10/1/2012	15%	5%
Sanibel, City Of	5	10/1/1996	25%	10%
Lee County Unincorporated Areas	5	10/1/2007	25%	10%

FEMA Repetitive Flood Claims

A repetitive loss (RL) property is defined as a facility or structure that has experienced two or more insurance claims of $1,000 or more in any given 10-year period since 1978, under the National Flood Insurance Program. A RL property may or may not be currently insured by the NFIP. Currently there are over 122,000 RL properties nationwide.

Based on information provided by all jurisdictions in Lee County, as of March 2017 there are 579 repetitive loss properties in Lee County. Fort Myers Beach has the greatest share of RPLs. Unincorporated County has the next greatest share (29.74%). A summary of these are shown in *Table 22*.

Table 22: Lee County Repetitive Loss Properties

Jurisdiction	Number of Repetitive Loss Properties
Bonita Springs, City Of	62
Cape Coral, City Of	3
Estero, Village of	1
Fort Myers Beach, Town Of	305
Fort Myers, City Of	8
Sanibel, City Of	64
Lee County Unincorporated Areas	136
Total:	579

Source: Latest information from municipalities and pulled from FEMA's CIS System

[43] FEMA Community Rating System https://www.fema.gov/national-flood-insurance-program-community-rating-system

Probability of Future Events

Flood events will remain high in Lee County, with a high probability of future occurrences. The probability and location of future flood events based on the magnitude and according to best available data is illustrated in *Figure 5*. Further, it is highly likely that Lee County will continue to experience inland and coastal flooding associated with large tropical storms, hurricanes and storm surge events.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined flooding to be a high priority hazard in Lee County. As described in the profile above, Flooding events within the county are common events with an annual probability greater than 1.0. Flooding events have a high range of impact, accounting for annual damages that exceed $150,000. The probable hazard magnitude for Flooding is high, including some recorded injuries but no deaths, and less than a 24-hour warning time before the event. *Table 23* outlines the hazard rankings for each of the hazard priority criteria related to Flooding.

Table 23. Flooding Hazard Priority

		Probable Hazard Magnitude:		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
High Common events with annual probability > 1.0	High Annual Damages exceeded $150,000	Medium Injuries but no deaths recorded	High Less than 24 hours	High

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

Flood losses to properties can be caused by storm tides from hurricanes and tropical storms or from storm water flooding caused by stream/canal overflow or sheet flow. Historical flood damages from tropical storms and hurricanes include foundation and wall damage to structures, contents damage, loss of utilities, infrastructure damage to roads, and beach erosion. Damages from storm water runoff events also include wall damage due to “wicking”, mildew damage, damages to contents, minor foundation damage, damage to water distribution systems, and potable water contamination. Public costs include debris clearance; equipment, material and labor expenses related to emergency response; and building or facility damage (county parks, utilities, communications).

The NCEI Storm Events data was annualized by taking the total number of damaging flood events and dividing by the length of record. The annualized values should be utilized only as an estimate of what can be expected in a given year. Using historical records, it can be estimated that Lee County will experience at least 2.31 events every year. Damages from these events can be expected in the magnitude of $201,000 for property and $0 for crop damages annually.

Table 24: Annualized Damages from Flood Events

Annualized Events	Annualized Property Damage	Annualized Crop Damages
2.3	$201,000	$0

FEMA's RiskMAP Program endeavored to produce flood risk analyses to estimate the potential losses from flooding across the Lower 48 states. This effort occurred circa 2009/2010 and produced a product known as the 2010 AAL Study Results. The 2010 AAL Study and its associated results were intended to be a mechanism for FEMA - as well as local stakeholders - to assist in the prioritization of flood mitigation activities across the lower 48 states. Further information on the 2010 AAL Results and its use in RiskMAP Risk Assessments can be viewed in Guidance for Flood Risk Analysis and Mapping (May 2014). Notably, there were some problem areas in which the Hazus software was unable to produce valid results for the 2010 AAL Study in certain coastal areas. Lack of estimated flood damages limited the ability to assess potential damage across the entirety of the regional geography. An analysis was performed to estimate the Total Exposure in the Floodplain of the building stock in Lee County, Florida. The subsequent sections describe the methodology and vulnerability assessment as part of this analysis.

Total Exposure in Floodplain (TEIF) Methodology: TEIF utilizes the 2010 Census TIGER tract level data to assume the total property value for each census tract within the county. The analysis proportionally divides that total census tract property value by the number of buildings in the tract, based on the area of each of the building footprints[44]. For example, if the total value of one census is $1,000,000 and there are 10 equally sized 1,000 square foot buildings within the tract, each building would be assigned a value of $100,000. If the buildings were not equal in size, they would receive more or less value proportionate to the size of the other buildings within that tract.

The building footprints are then intersected with the FEMA effective 100-year and 500-year floodplain data. The proportion of how much each building is within each floodplain is then used to calculate the value of the building's exposure to the floodplain. Due to the low resolution of the property values from the tract data, the high resolution of the buildings, and the assumption of total exposure within the floodplain, the exposed values are extrapolated to 1000 foot square grids. This resolution best summarizes the results of the TEIF analysis at a countywide scale, identifies areas that may be more affected by a flood, and represents the uncertainty within this method.

TEIF Vulnerability Analysis and Assessment: The results of the analysis identified many areas within each jurisdiction that may be at risk to flood. The unincorporated areas of Lee County are considered most at risk, accounting for 45 percent of the total exposure in the county. The City of Cape Coral is the second most at risk jurisdiction with $717 million worth of building stock exposed to the 100-year floodplain, or 25.6% of the total exposure in the county. Figure 6: Total Exposure in 100 Year Floodplain (TEIF)

[44] Building footprints shapefile provided by Lee County.

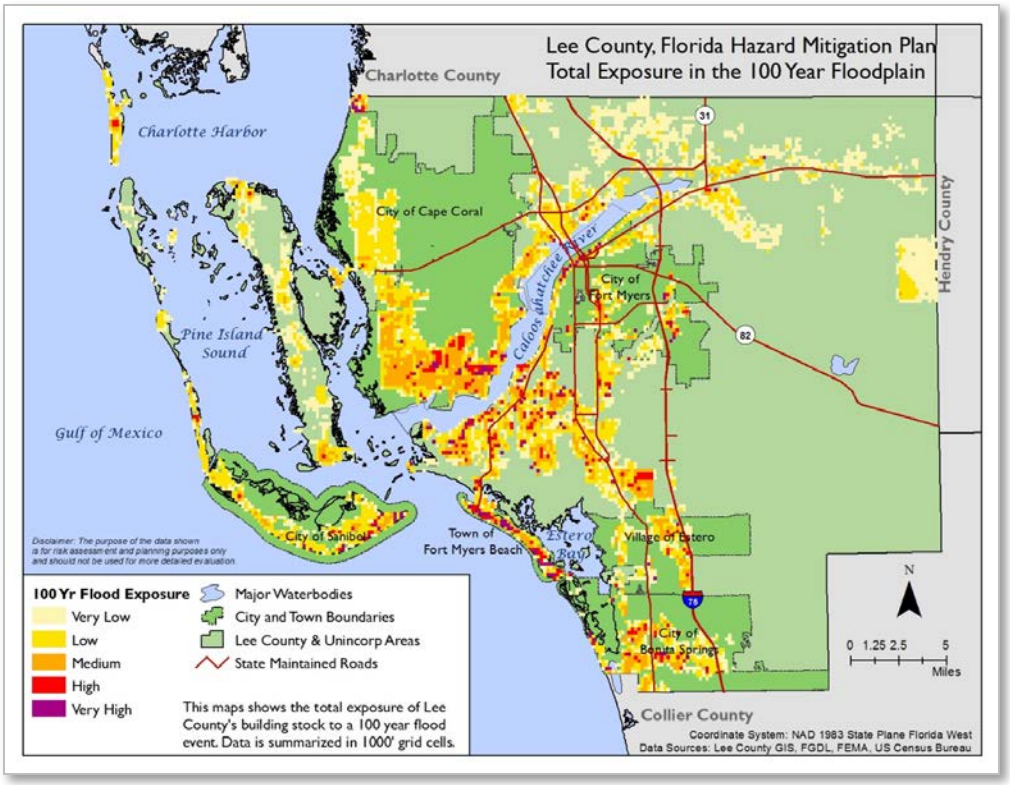


Table 25 summarizes the results of the TEIF analysis in Lee County by jurisdiction. Note that all values have been rounded to three significant figures to represent the uncertainty carried within this method. Figure 6 and *Figure 7* show the TEIF results shown by 1000 foot square grids to show the greater at risk areas within the county based on 100 year and 500 year floodplains.

Figure 6: Total Exposure in 100 Year Floodplain (TEIF)

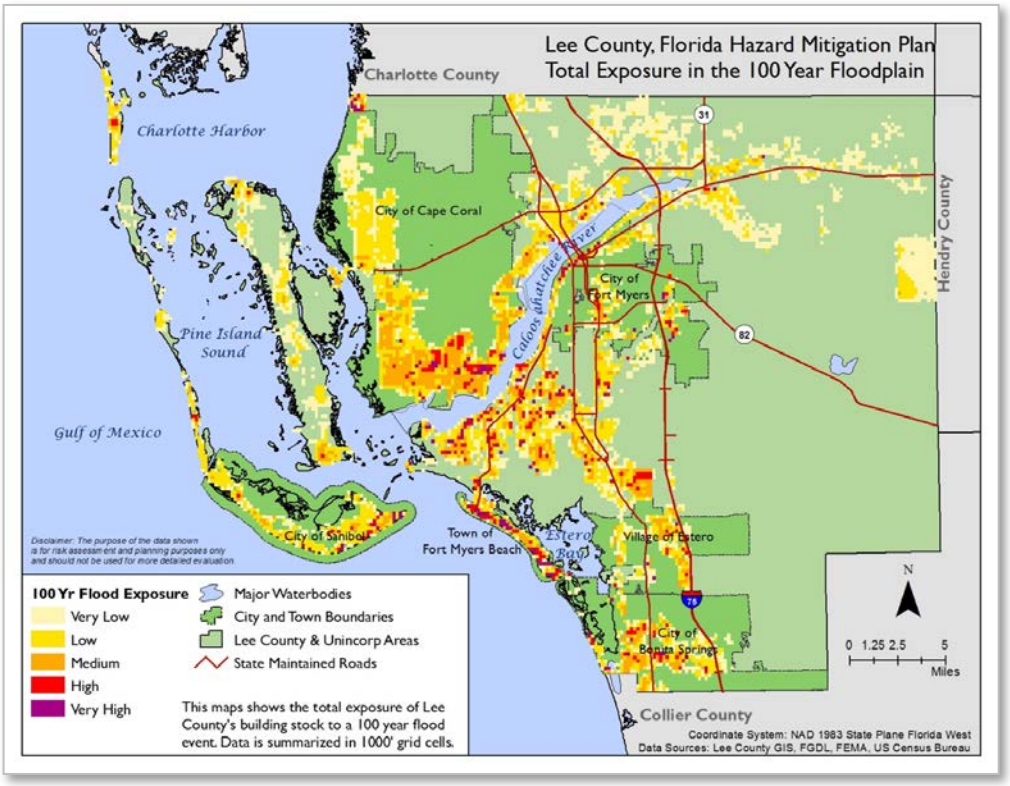


Table 25: Total Exposure in Floodplain (TEIF) 100 Year Summary by Jurisdiction

City Name	TEIF Value in Floodplain	Percent of Lee County
City of Bonita Springs	$229,000,000	8.18%
City of Cape Coral	$717,000,000	25.6%
City of Fort Myers	$177,000,000	6.32%
City of Sanibel	$167,000,000	5.97%
Town of Fort Myers Beach	$140,000,000	5.00%
Unincorporated County	$1,260,000,000	45.0%
Village of Estero	$109,000,000	3.89%
Total	$2,799,000,000	100%

The critical facilities shapefile was also intersected within the TEIF grid. For displaying purposes, the grid values were divided into five categories: Very Low, Low, Medium, High, and Very High. Where values were 1.5 or less standard deviations below the mean, they were classified as Very Low, between 1.5 and 0.5 below the mean were Low, between 0.5 below and 0.5 above the mean were medium, between 0.5 and 1.5 above the mean were high, and those 1.5 or above the mean were very high. *Table 26* summarizes the number of critical facilities within each of these risk categories. The unincorporated part of the county had the most critical facilities at risk, with 17 in the "very high" TEIF grids. The Town of Fort Myers Beach followed second with 10 critical facilities in the very high zone.

Figure 7: Total Exposure in 500 Year Floodplain (TEIF)

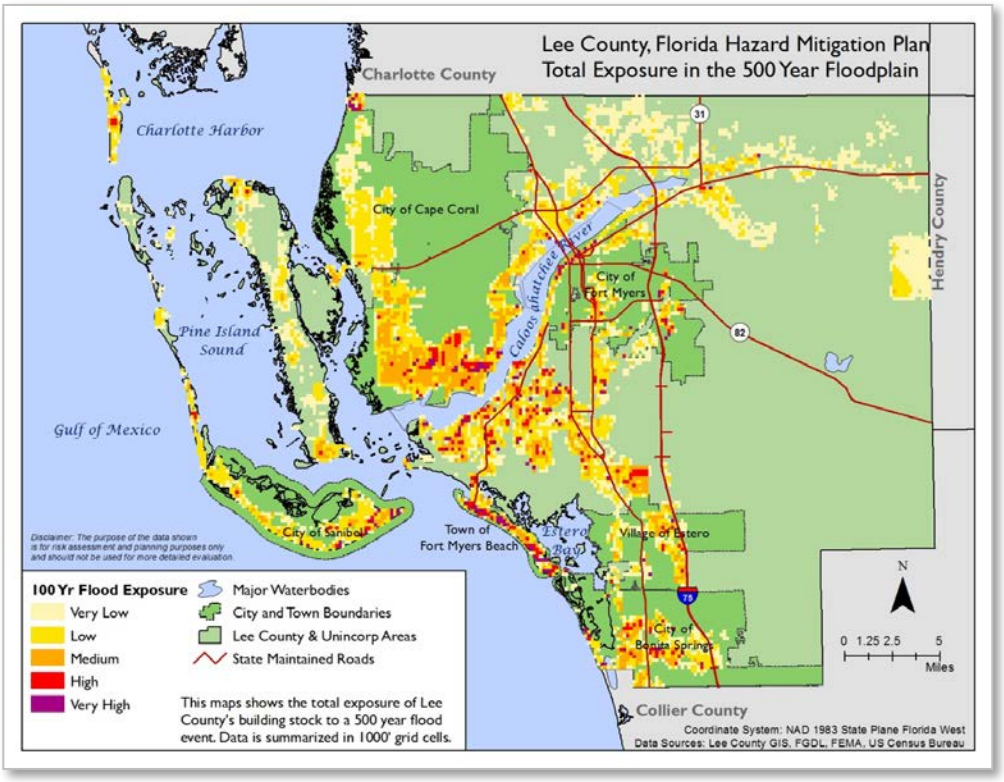


Table 26: Critical facilities in 100 Year TEIF Grids by Rank

Jurisdiction	Very High	High	Medium	Low	Very Low	Not in TEIF	Total
City of Bonita Springs	0	3	7	14	15	58	97
City of Cape Coral	8	10	17	31	18	153	237
City of Fort Myers	7	7	13	24	31	199	281
City of Sanibel	0	5	9	7	10	0	31
Town of Fort Myers Beach	10	6	5	4	0	0	25
Unincorporated County	17	15	129	55	157	379	752
Village of Estero	0	0	1	11	14	29	55
Total:	42	46	181	146	245	818	1478

Of the 1,478 total critical facilities identified in Lee County, there are 660 facilities located in the 100-year floodplain that are considered vulnerable to the effects of flooding.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Freeze/Extreme Cold

Description

A ***freeze*** is a condition that exists when, over a widespread area, the surface temperature of the air remains below freezing (32ºF or 0ºC) for a sufficient time to constitute the characteristic feature of the weather. A freeze is also a term used to describe the condition when vegetation is injured by these low air temperatures, regardless if frost is deposited. Frost is a cover of ice crystals produced by the deposition of atmospheric water directly on a surface at or below freezing.

Prolonged exposure to the freezing temperatures can cause frostbite or hypothermia and become life threatening. Infants and elderly people are most at risk. In areas, unaccustomed to winter weather, near freezing temperatures are considered ***extreme cold***. During unexpected cold periods in Florida, there are often issues with propane gas supplies, and electrical and natural gas systems are pushed to their limits to meet the record demands. Also, many residents of Florida have inadequate heating systems and insulation and turn to alternatives such as space heaters and wood fires that increase the likelihood of accidental house fires.

Location and Extent

Although somewhat rare, winter storms and freezes can immobilize an entire region. Even areas like Lee County that normally experience mild winters can be greatly affected. All parts of Lee County are considered to be equally likely to be impacted by extreme cold and freeze events.

In 1989, a cold outbreak and hard freeze affected all 67 counties in Florida. Extensive crop damage was seen including a loss of about 30% of the $1.4 billion citrus crop. Power blackouts hit hundreds of thousands of residents at various times during the event. *Table 27* displays the critical temperatures at which citrus fruits, buds and blossoms begin to freeze.

Table 27: Critical fruit temperatures (Tc) for Citrus Fruit

Citrus Species	Critical Temperature (°C)
Green oranges	-1.9 to -1.4
Half ripe oranges, grapefruit and mandarins	-2.2 to -1.7
Ripe oranges, grapefruit and mandarins	-2.8 to -2.2
Button lemons	-1.4 to -0.8
Tree ripe lemons	-1.4 to -0.8
Green lemons (diameter >12 mm)	-1.9 to -1.4
Lemon buds and blossoms	-2.8

During the harsh winter of 1989-1990, 26 Floridians died of hypothermia. Because of normally mild temperatures, Florida homes often lack adequate heating and insulation and the Florida outdoor lifestyle, leads to danger for those not prepared. In addition to the actual temperature, when the wind blows, a wind chill (the temperature that it feels like) is experienced on exposed skin. When freezing temperatures, or low wind chills are expected, the National Weather Service will issue warnings or advisories. Lee County is expected to see freezes in the future similar to events that have occurred in the past.

Previous Occurrences

From the NOAA NCEI Storm Events Database, Lee County has experienced 61 freeze type events since 1996. This includes events such as:

- Cold/Wind Chill (1)
- Dense Fog (45)
- Extreme Cold/Wind Chill (2)
- Frost/Freeze (13)

Since 1996, the NCEI records show that $18.1 thousand of annual property damage has occurred and that $1.57 million of annual crop losses have occurred.

In the state of Florida, there have been seven major disaster declarations as designated by FEMA that involved severe winter weather; these include:

- March 15, 1971
- January 31, 1977
- March 29, 1984
- March 18, 1985
- January 15, 1990
- March 13, 1993
- February 6, 2001

Probability of Future Events

Extreme temperatures are often unpredictable and may be localized, which makes it difficult to assess the probability. As the population increases, the demand placed on farmers becomes higher. Due to this larger demand, we can expect to have higher financial losses in the future. Freezes may also necessitate the opening of local shelters and the mobilization of personnel and resources for the protection of homeless persons or residents of sub-standard dwellings. Lee County can expect to experience this hazard in the future.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined extreme freezes to be a low priority hazard in Lee County. As described in the profile above, extreme freezes events within the county are frequent events with an annual probability between 0.5 and 1.0. Extreme freeze events have a low range of impact, accounting for less than $50,000 in annual damages. The probable hazard magnitude for extreme freezes is low, including no deaths or injuries, and more than three days warning time before the event. *Table 28* outlines the hazard rankings for each of the hazard priority criteria related to extreme freezes.

Table 28: Extreme Freeze Hazard Priority

		Probable Hazard Magnitude:		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
Medium Frequent events with annual probability between 0.5 and 1	Low Annual Damages less than $50,000	Low No deaths or injuries recorded	Low Three days or more	Low

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

Even small accumulations of ice can cause a significant hazard, especially on power lines and trees. An ice storm occurs when freezing rain falls and freezes immediately upon impact. Communications and power can be disrupted for days, and even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Extended power outages from ice storms would require residents to look for supplemental heat sources; improper use of these sources could result in house fires. Injuries could result from slipping on ice if residents, especially elderly, were to leave their home.

Injuries and death during winter storms are usually caused from transportation accidents and hypothermia. Ice can cause disruptions in transportation lines and utilities resulting in emergency response delays. Secondary effects of winter storms include carbon monoxide poisoning and house fires from increased and improper use of alternative heating sources. Socially vulnerable populations and rural communities are especially at-risk to winter storms; these include children under five (4.7% of Lee County population) and people older than 65 (26.9% of Lee County population). Figure 8 shows the concentration of population in Lee County that is younger than 5 years old, and *Figure 9* shows the concentration of population that is older than 65 years of age in Lee County. Both figures provide a visual understanding of where the hot spots are of the populations most vulnerable to extreme cold in Lee County.

Figure 8: Population Younger than 5 Years of Age by Census Block in Lee County

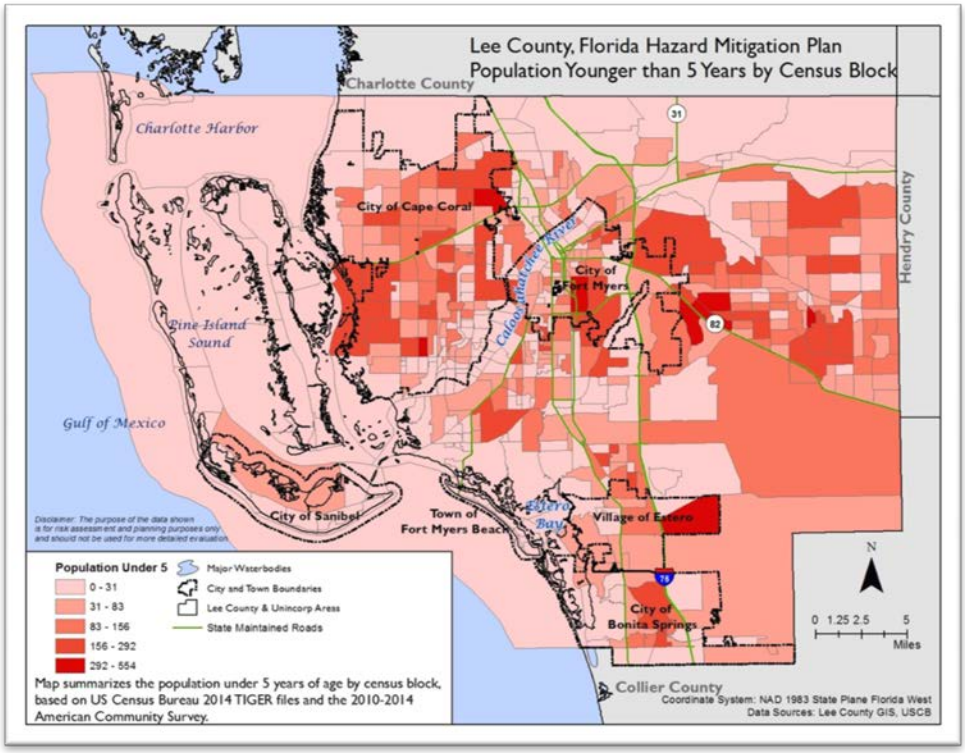
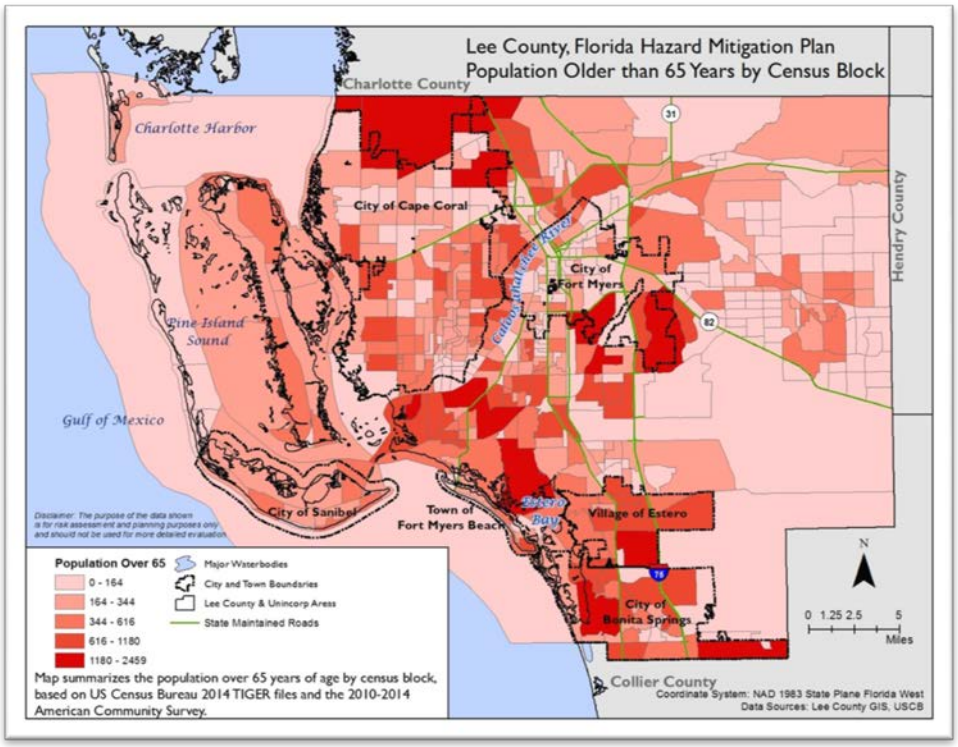


Figure 9: Population Older than 65 Years of Age by Census Block in Lee County



The NCEI Storm Events data was annualized by taking the total number of damaging freeze events and dividing by the length of record. The annualized values should only be utilized as an estimate of what can be expected in a given year. Using historical records, it can be estimated that Lee County will experience at least 0.76 events every year. Damages from these events can be expected in the magnitude of $18,100 for property and $1,570,000 for crop damages annually. Table 29 shows the annualized results for freeze events in Lee County.

Table 29: Annualized Damages from Freeze Events

Annualized Events	Annualized Property Damage	Annualized Crop Damages
0.76	$18,100	$1,570,000

The assets most at risk to extreme cold and freeze are the agricultural interests of Lee County. According to the 2012 Census of Agriculture, the total value of crops and livestock sold from Lee County was $105,903,000, including $101,469,000 of crops and $4,434,000 of livestock. Lee County contains 844 farms on 87,125 acres. The farms vary in their total sales in 2012, as shown in *Table 30*. About 45% of the farms sold less than $2,500 and around 80% sold less than $25,000.

Table 30: USDA Census of Agriculture Farm Counts by Value of Total Sales in 2012

Farms Value of Sales	Total Number of Farms
Less than $2,500	378
$2,500 to $4,999	109
$5,000 to $9,999	80
$10,000 to $24,999	109
$25,000 to $49,999	60
$50,000 to $99,999	46
$100,000 or more	62
Total	844

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Storm Surge Flooding

Description

Storm surge causes widespread coastal flooding and is exclusively associated with tropical cyclones and is considered one of the most dangerous aspects of these kinds of storms. Storm surge occurs when the winds and forward motion associated with a storm piles water up in front as it moves toward shore. This advancing surge combines with the normal tides to create the hurricane storm tide that can increase the mean water level 20 feet or more. These wind-generated storms can cause flooding, coastal erosion, and structural damage, both in coastal areas and farther inland in worst-case scenarios.

Storm surge heights, wind speed, fetch length, pressure and associated waves are dependent upon the configuration of the continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). These as well as other factors can impact storm surge height and wave height.

While rare, storm surge risk in certain scenarios is elevated throughout Southwest Florida as compared to other areas of Florida. Large, slow moving tropical cyclones impacting Lee County at the right angle of approach would have significant consequences.

Location and Extent

Storm surge flooding can occur anywhere along the estimated 252 miles of shoreline in Lee County[45] as a result of storm surge caused by hurricanes and tropical storms. Not all storms which pass close to Lee County cause extremely high storm surges. Similarly, storms which produce extreme conditions in one area may not necessarily produce critical conditions in other areas. However, when high winds are directed onshore as a result of a hurricane or tropical storm, storm surge is produced that can inundate the coastal islands and flood the adjacent inland coastal areas. Wave action which accompanies wind-generated storms can cause flooding, erosion, and structural damage, particularly on the barrier islands.

The topography of Lee County is generally low and flat, with 35% of the developed area of the county below 10 feet NAVD.[46][47] A chain of islands with numerous inlets and large expanses of water forms a barrier to the mainland. These islands are particularly susceptible to tidal and storm surge flooding due to coastal storm events with storm surge. The small dunes along the beach provide very little protection from wave action[48].

The Caloosahatchee River is a broad estuary and, under certain conditions, storm surge generated at its mouth can intrude upstream. The rainfall that accompanies hurricanes and tropical storms can contribute to flooding, particularly where the secondary drainage system is poorly developed. Freshwater flooding was considered in the coastal zone, but it is not as significant as flooding caused by storm surge in terms of damaging effects. *Table 31* highlights the impacts of storm surge hazards.

Table 31: Storm Surge Impacts

Extent of Hazard (Storm Surge):	Impacts
High: 4+ feet	Major Structural Flooding, loss of life, and major beach erosion
Medium: 3-4 feet	Flood damage to infrastructure
Low: 0-3 feet	Damage to sea turtle nests, minor beach erosion

Previous Occurrences

From 1873 to 1993, Southwest Florida experienced 49 tropical cyclones of hurricane intensity. Eight of these typical cyclones were not differentiated as tropical storms or hurricanes. Therefore, some of these early storms could have been below hurricane intensity. Seventeen hurricanes passed within 50 miles of Fort Myers, averaging one every

[45] Lee and Hendry Discovery Report, 2014
[46] 2008 Countywide FIS, Lee County, FL
[47] Lee County GIS
[48] Ibid

seven years. For the 50 to100-mile radius from Fort Myers, an additional 32 hurricanes passed by and through the region at a rate of one every two and one-half years.[49]

According to NOAA, NCEI Storm Events Database, 19 hurricane and tropical storm events occurred in Lee County between 1994 and 2008. As a result of these storms there were 16 deaths and 833 injuries. Property damaged totaled $5.911 billion. Crop damage totaled $300.5 million. Following is a brief description of recent hurricane and tropical storm events that have directly or indirectly threatened/impacted Lee County. The following is a list of historical events that have caused notable storm surge flooding in Lee County:

June 25, 2012 Tropical Storm Debby: In Lee County, the highest storm total rainfall reported from Tropical Storm Debby was 4.95 inches at the Cape Coral CoCoRaHS station. The county suffered $2.3 million in damage to beaches, mostly on Captiva Island and Sanibel, while another $300 thousand in damage to homes was recorded. The tide gauge at Fort Myers measured a peak tide of 3.98 feet MLLW on afternoon of the 25th. Subtracting the predicted astronomical tide, the highest storm surge was calculated as 3.09 feet on the afternoon of the 25th.

August 19, 2008 Tropical Storm Fay and additional Flooding: Tropical Storm Fay made landfall in Collier County and initially caused little damage to Lee County. During TS Fay's course, it again went over water and came back into Florida on a Westward track. Rainfall and related sheetflow flooding from TS Fay caused the evacuation of Saldivar Migrant Camp and Manna Christian Mobile Home Park in the Bonita Springs area. The Bayshore and Alva areas also experienced some flooding issues, including private roads.

August 13, 2004 Hurricane Charley: The storm surge associated with Hurricane Charley caused an estimated eight foot above normal tides that created a new 300 yards wide path across North Captiva. Tides were six feet above normal at Fort Myers Beach, and four feet at both Horseshoe Key and Port Boca Grande. In contrast, Charlotte Harbor experienced tides four feet below normal.

July 23, 2001 Coastal Flooding: A slow moving and persistent low pressure system, west of the mouth of Tampa Bay, produced coastal flooding, very heavy rain, and sustained winds of 20 to 30 mph with occasional higher gusts of up to 50 mph, from Tampa south to Fort Myers, along the West coast of Florida. Storm tide values ranged from 2.7 feet above mean sea level (MSL) along the coast in Lee County, 3 to 4 feet above MSL in Manatee, Sarasota, Pinellas, and southern Pasco counties, to 4.4 feet above MSL in along the Hillsborough County side of Tampa Bay.

Probability of Future Events

Based on historical data from the NCEI, the probability of a land- falling hurricane in Lee County for a given year is one every two to three years. For tropical storms, the probability is one occurrence every one to two years. This does not mean that it is not possible for hurricanes and tropical storms to appear more frequently in Lee County. For instance, Lee County encountered three hurricanes in 2004 and two in 2005.

Vulnerability and Risk Assessment

Hazard Ranking

[49] *Hurricane Evacuation Study,* Southwest Florida Regional Planning Council, http://www.swfrpc.org/content/Emergency_Mgmt/Hurricanes.pdf

The priority hazard ranking process for the 2017 HIRA determined storm surge flooding to be a medium priority hazard in Lee County. As described in the profile above, Storm surge flooding events within the county are infrequent events with an annual probability of less than 0.5. Storm surge flooding events have a high range of impact, accounting for annual damages that exceed $150,000. The probable hazard magnitude for Storm surge flooding is medium, including no recorded deaths or injuries, and a one- to two-day warning time before the event. Table 32 outlines the hazard rankings for each of the hazard priority criteria related to Storm surge flooding.

Table 32: Storm Surge Hazard Priority

		Probable Hazard Magnitude		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
Low Infrequent events with annual probability < 0.5	High Annual Damages exceeded $150,000	Low No deaths or injuries recorded	Medium 1 - 2 days	Medium

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

Areas near the coast are more likely to experience storm surge flooding from storm surge associated with tropical cyclones. Non-elevated structures built prior to the 1980s when National Flood Insurance Program (NFIP) building standards were adopted are especially vulnerable to damage.

The storm surge flooding events extracted from the NCEI Storm Events Database were annualized by taking the total number of damaging storm surge flooding events and dividing by the length of record. The annualized values should be utilized only as an estimate of what can be expected in a given year. Using historical records, it can be estimated that Lee County will experience at least 0.31 events every year. Damages from these events can be expected in the magnitude of $184,000 for property and $0 for crop damages annually. *Table 33* shows the annualized results for storm surge flooding events in Lee County.

Table 33: Annualized Damages from Storm surge flooding Events.

Annualized Events	Annualized Property Damage	Annualized Crop Damages
0.31	$184,000	$0

Table 34 summarizes the number of buildings that will be impacted by storm surge associated with tropical storms and hurricanes of increasing magnitude. These building counts were derived by intersecting the building footprint layer provided by Lee County with the Florida SLOSH data. In *Table 34*, Categories 1 through 5 correlate to the Saffir-Simpson Hurricane Wind Scale that rates hurricanes based on the storm's sustained wind speed. A Category 5 storm has the highest sustained winds and is considered the most dangerous.[50] The storm surge data was developed by the National Weather Service (NWS) using the Sea, Lake and Overland Surges from Hurricanes (SLOSH) model, a computerized numerical model. The SLOSH model estimates storm surge heights resulting from historical, hypothetical, or predicted hurricanes by considering the atmospheric pressure, size, forward speed, and track data. These parameters are used to create a model of the wind field which drives the storm surge.[51] *Figure 10* displays the areas of Lee County that might be inundated by storm surge from hurricanes of different magnitudes.

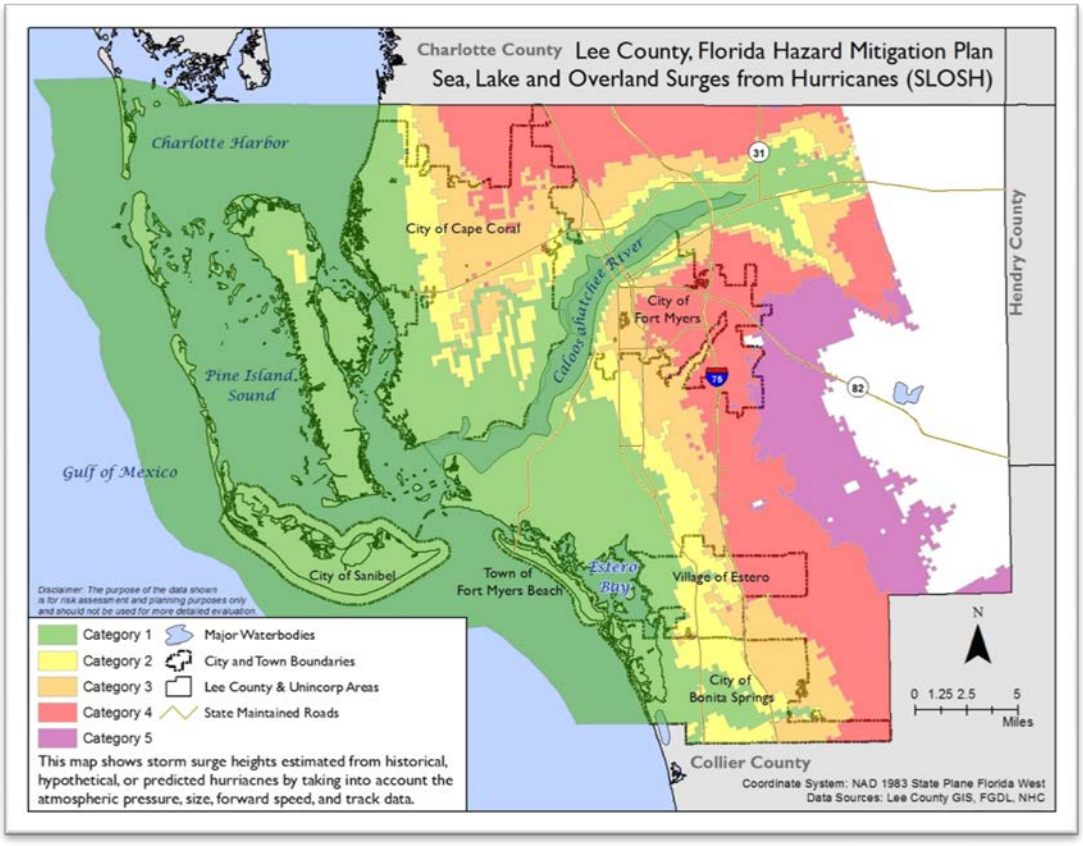
[50] "Saffir-Simpson Hurricane Wind Scale" http://www.nhc.noaa.gov/aboutsshws.php

[51] "Sea, Lake, and Overland Surges from Hurricanes (SLOSH)" http://www.nhc.noaa.gov/surge/slosh.php

Table 34: Storm Surge Impact by Modeled SLOSH Hurricane Category

	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5	Total in Jurisdiction
City of Bonita Springs	6,687	10,486	17,282	20,548	22,276	22,276	22,276
City of Cape Coral	27,011	37,048	55,200	69,831	73,639	73,639	73,639
City of Fort Myers	1,570	2,337	6,463	13,583	24,293	25,088	25,096
City of Sanibel	4,767	4,767	4,767	4,767	4,767	4,767	4,767
Town of Fort Myers Beach	3,296	3,296	3,296	3,296	3,296	3,296	3,296
Unincorporated	40,447	48,589	68,149	84,974	97,588	110,685	122,771
Village of Estero	843	2,347	9,344	11,566	15,991	15,991	15,991

Figure 10: Storm Surge Inundation Zones by Hurricane Category



See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Sustained Wind (Tropical Cyclones)

Description

In general terms, a hurricane is a type of tropical cyclone. A tropical ***cyclone*** is any closed circulation developing around a low-pressure center in which the wind rotates counterclockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a "safety-valve" that limits the build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole ward latitudes.[52]

As a tropical cyclone develops over warm water, pressure drops (measured in millibars or inches of Mercury) in the center of the storm. As the pressure drops, the system becomes better organized and the winds begin to rotate around the low pressure, pulling in the warm and moist ocean air. It is this cycle that causes the wind (and rain) associated with a tropical cyclone. If all of the conditions are right (warm ocean water and favorable high altitude winds), the system could build to a point where it has winds in excess of 155 miles per hour and could become catastrophic if it makes landfall in populated areas.

The Saffir-Simpson Hurricane Wind Scale, the standard describing an event's disaster potential, uses wind speed, central pressure, and damage potential to create storm classifications. The Scale consists of 1 to 5 categorizations based on the hurricane's intensity at the indicated time and provides examples of the type of damage and impacts in the United States associated with winds of the indicated intensity. In general, damage rises by about a factor of four for every category increase.

Table 35 shows the Saffir-Simpson Hurricane Wind Scale that is used to classify tropical storms and hurricanes based on the potential wind damage.

Table 35: Saffir-Simpson Hurricane Wind Scale and Typical Damages

Category	Sustained Wind Speeds (mph)	Pressure (mob)	Typical Damage
Tropical Depression	<39	--	
Tropical Storm	39-73	--	
Hurricane 1	74-95	> 980	*Minimal* – Damage primarily to shrubbery and trees, unanchored manufactured homes damaged, some signs damaged, no real damage to structures on permanent foundations.
Hurricane 2	96-110	965-980	*Moderate* – Some trees toppled, some roof coverings damaged, major damage to manufactured homes.
Hurricane 3	111-130	945-965	*Extensive Damage* – Large trees toppled, some structural damage to roofs, manufactured homes destroyed, structural damage to small homes and utility buildings.

[52] 2013 State of Florida Hazard Mitigation Plan

Category	Sustained Wind Speeds (mph)	Pressure (mob)	Typical Damage
Hurricane 4	131-155	920-945	*Extreme Damage* – Extensive damage to roofs, windows, and doors; roof systems on small buildings completely fail; some curtain walls fail.
Hurricane 5	> 155	< 920	*Catastrophic Damage* – Roof damage considerable and widespread, window and door damage severe, extensive glass failures, some buildings fail completely.

The hurricane season is defined as June 1 through November 30. The earliest hurricane to strike the United States during this date range was Alma which struck northwest Florida on June 9, 1966, while the latest hurricane to strike the U. S. during a hurricane season was was late on November 30, 1925 near Tampa, Florida.[53]

Other hydro-meteorological hazards associated with hurricanes include the following: storm surge flooding; windstorms due to extremely strong winds; riverine flooding caused by heavy rains; and, tornadoes. These hazards are not exclusively associated with tropical cyclones and therefore will not be described in this hazard profile. For more information, refer to the section for each hazard.

Location and Extent

The entire state of Florida is at risk of the damaging effects of hurricane and tropical storm wind damage. The average diameter of hurricane force winds is 100 miles, with tropical storm force winds extending out 300 – 400 miles. Since there is no point in Florida wider than 70 miles from the Gulf of Mexico to the Atlantic Ocean, damaging hurricane winds can be felt throughout the state.

As a coastal county, Lee County is especially vulnerable to hurricane force winds when hurricanes make landfall on the Gulf side of the state. Land that is near the coastline is more vulnerable to the high winds associated with tropical cyclones but all buildings within the county are susceptible to wind damage from tropical cyclones.

Figure 11: Ultimate Design Wind Speeds – Risk Category I Buildings

[53] Sumter County website.

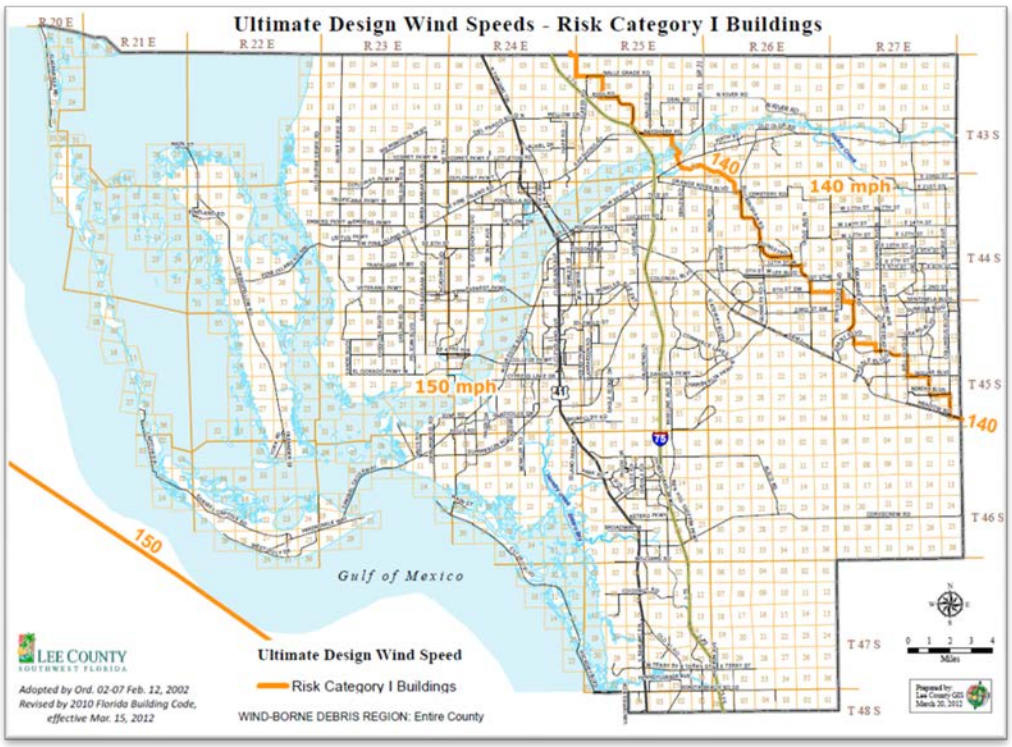
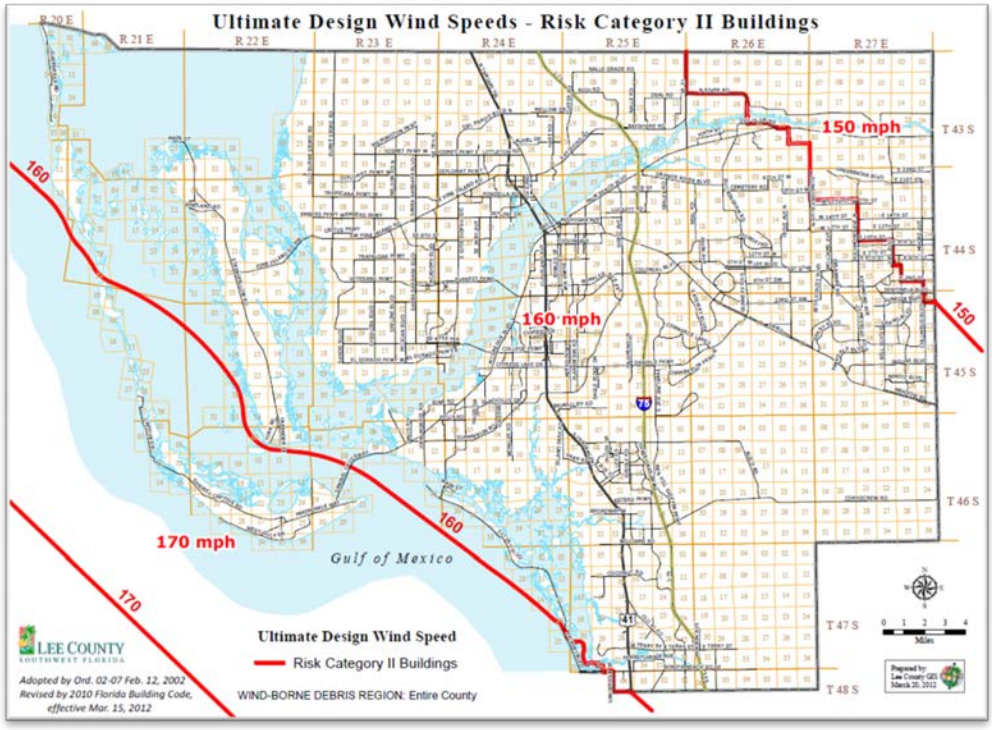


Figure 12: Ultimate Design Wind Speeds - Risk Category II Buildings



, *Figure 12*, and *Figure 11* depict the geographical boundaries of the wind speed zones and the wind-borne debris regions in Lee County for Risk Categories I, II, III and IV buildings. Risk Categories in building codes are assigned to reflect the current understanding of risk to human life, health and welfare associated with damage or failure of a facility by nature of its occupancy or use. Therefore, Risk Category IV includes buildings at highest risk, if severely damaged, to reducing availability of essential community services necessary to respond to an emergency, i.e. a critical facility[54].

[54] https://www.fema.gov/media-library-data/1385591327349-677ba8c4e88360b7436338fb87221af2/Sandy_MAT_AppI_508post.pdf

Figure 11: Ultimate Design Wind Speeds – Risk Category I Buildings

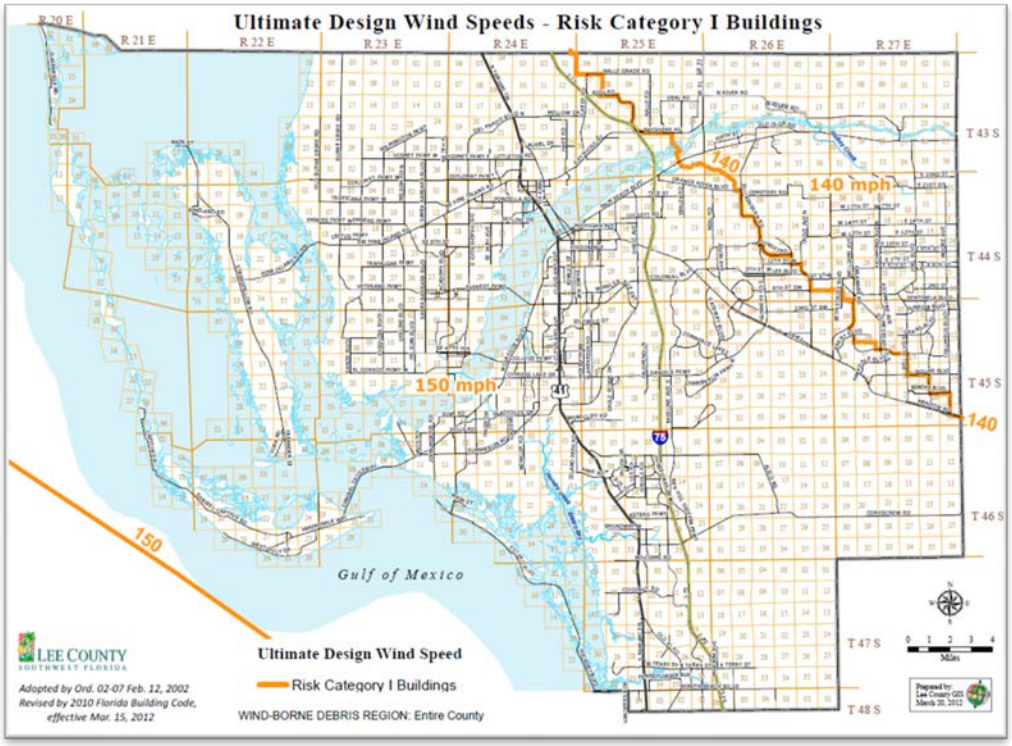


Figure 12: Ultimate Design Wind Speeds - Risk Category II Buildings

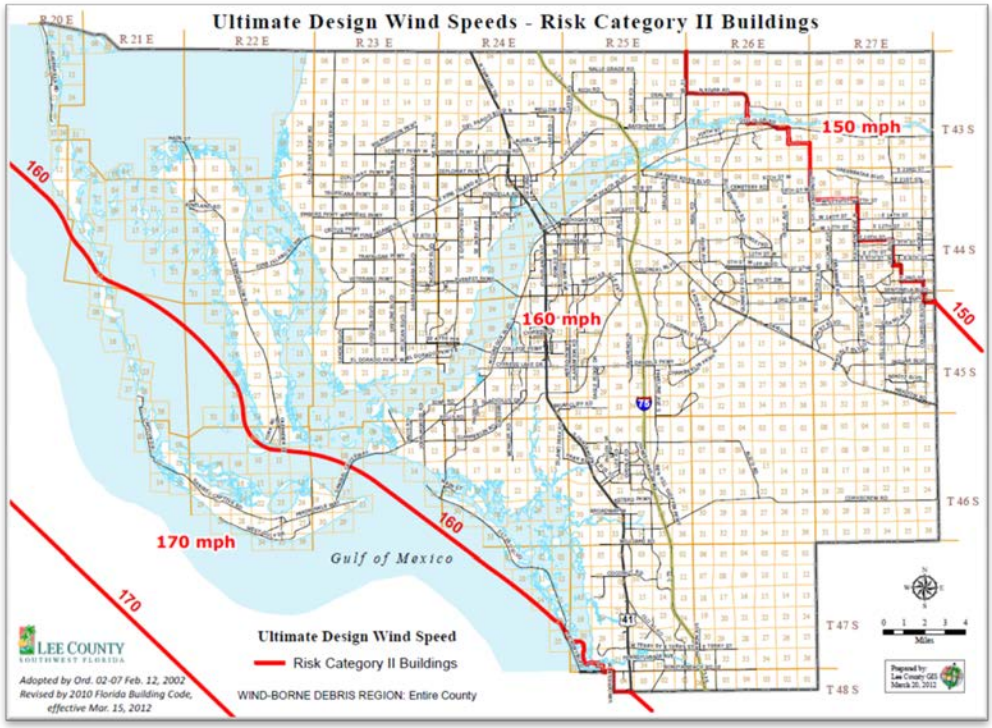
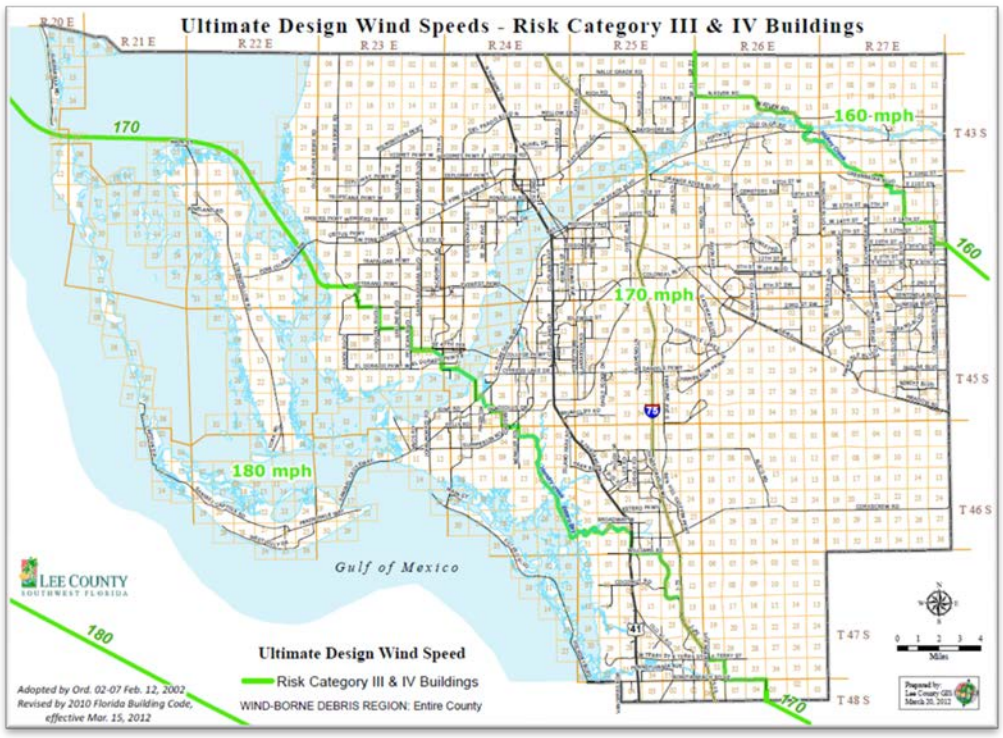


Figure 13: Ultimate Design Wind Speeds - Risk Category III & IV Buildings



Previous Occurrences

From 1873 to 1993, Southwest Florida experienced forty-nine tropical cyclones of hurricane intensity. Eight of these typical cyclones were not differentiated as tropical storms or hurricanes. Therefore, some of these early storms could have been below hurricane intensity. Seventeen hurricanes passed within fifty miles of Fort Myers, averaging one every seven years. For the fifty-to-one-hundred-mile radius from Fort Myers, an additional thirty-two hurricanes passed by and through the Region at a rate of one every two and one-half years.[55]

According to the NOAA NCEI Storm Events Database, 19 hurricane and tropical storm events occurred in Lee County between 1994 and 2008. There were 16 deaths and 833 injuries reported as a result of these storms. Property damages totaled $5.911 billion and crop damages totaled $300.5 million. Hurricane Matthew threatened Lee County in 2016 and was the last storm to impact the area. The following is a brief description of recent hurricane and tropical storm events that have directly or indirectly threatened and/or impacted Lee County.

June 26, 2012 Tropical Storm Debby: Tropical Storm Debby made landfall in the big bend area of Florida in June of 2012. While landfall was north of Lee County, strong on-shore winds, some flooding along coastal roads and low-lying areas and beach erosion did occur.

[55]Southwest Florida Regional Hurricane Evacuation Studies Program (2010): http://www.swfrpc.org/content/Emergency_Mgmt/Hurricanes.pdf

August 19, 2008 Tropical Storm Fay: Tropical Storm Fay made landfall in Collier County and initially caused little damage to Lee County. During TS Fay's course, it again went over water and came back into Florida on a Westward track. The ensuing rain bands from TS Fay caused the evacuation of Saldivar Migrant Camp and Manna Christian Mobile Home Park in the Bonita Springs area. The Bayshore and Alva areas also experienced some flooding issues, including private roads.

October 24, 2005 Hurricane Wilma: Hurricane Wilma made landfall near Cape Romano in Collier County around daybreak on October 24th as a Category 3 hurricane with a 60-mile-wide eye wall. The storm produced widespread heavy rains of 4 to 8 inches across the area but unseasonably dry conditions prior to Wilma limited flooding. Storm surge was not a problem in the Fort Myers area as winds were offshore. In Lee County...The north part of Hurricane Wilma's eye wall passed along the Lee/Collier county border. Southern Lee County received widespread minor to isolated moderate damage. A peak wind gust of 87 MPH was reported at the C-MAN station at Big Carlos Pass at 654 AM EDT. The Southwest Florida International Airport recorded a peak recorded a peak wind from the north of 79 MPH at 828 AM EDT and Page Field recorded a peak wind of 76 MPH at 812 AM EDT. Damages to private property were initially estimated at $108.4 million in structure damage. Of this, $69.7 million was attributed to flooding. Final total structures affected to date are 959. Homeowner insurance claims totaled 23,639 with $182,709,253 being paid out. To date, 47 flood claims have been paid totaling $945,168. The debris totaled about 200,000 cubic yards, or about 1/10 of the debris left by Hurricane Charley in 2004. Power was out to about 208,000 customers at the peak of the storm.

July 19, 2005 Hurricane Dennis: A bubble of storm surge from Hurricane Dennis moved north along the west Florida Gulf Coast during the day. The surge peaked at Fort Myers around 3:30 AM EDT. Lee County: Fort Myers - Storm Surge 3.08 feet at 3:36 AM EDT, Storm Tide 3.20 feet at Four to six inches of rain fell near Punta Gorda and Fort Myers. In Lee County, maximum winds were estimated at 40 MPH with gusts to 50 MPH along Sanibel Island. No significant damage was reported.

September 26, 2004 Hurricane Jeanne: Hurricane Jeanne followed the nearly the same path across Florida as Hurricane Frances three weeks earlier. In Lee County, the Big Carlos Pass observation recorded a gust to 49 knots (56 MPH) from the west southwest at 7:42 AM EST on 09/26/2004.

September 5, 2004 Hurricane Frances: Hurricane Frances made landfall just after midnight on September 5th near Vero Beach as a Category 2 storm. In Lee County, the observation at Big Carlos Pass recorded a gust to 51 knots (59 MPH) from the west at 12:18 AM EST on 09/05/2004. One direct death was reported when an elderly man was blown over by a wind gust while walking his dog 10 feet outside of his home. He hit his head on the sidewalk and died from blunt force trauma. Fourteen homes were destroyed by the wind.

August 13, 2004 Hurricane Charley: Hurricane Charley made landfall just north of Captiva with sustained winds estimated at 145 mph. The center of Charley crossed the barrier islands of Cayo Costa and Gasparilla Island at 345 PM EDT. The storm produced an eight to nine-foot storm surge in Lee County: The storm surge created a new pass 300 yards wide across North Captiva Island. The storm surge was estimated at 4 to 6 feet at Fort Myers Beach, Horseshoe Key, and Port Boca Grande. A personal weather station in Fort Myers recorded a wind gust of 95 mph. The total number of structures affected was 18,160. Homeowner insurance claims totaled 77,582 with $911,784.880 paid out. To date, 2,274 flood claims have been paid totaling $44,432,069. Seven deaths were attributed to this storm in Lee County.

September 14, 2001 Tropical Storm Gabrielle: Tropical Storm Gabrielle began to affect the Southwest Florida coast during the pre-dawn hours of September 14th with sustained winds of 40 to 50 mph along the coasts of Lee and other counties. Total damage across the 15 county-area of Southwest and West Central Florida from Gabrielle was estimated to be nearly 17 million dollars. In Lee County, tropical storm wind gusts of 45 to 55 mph and flooding caused up to 5.7 million dollars in damage. Most of the wind damage was caused to roof shingles, carports, and lanais, mainly in the Cape Coral area. Flooding caused major damage to nearly 100 homes and another 500 incurred minor flood damage, mainly due to storm tides of three to four feet along coastal areas from Ft. Myers Beach to Sanibel, Captiva, and Pine Islands from sunrise through 1 pm. At least four, separate and distinct, narrow sporadic tornadoes occurred with the outer spiral bands on the east side of Gabrielle. All tornadoes observed produced minor damage, were determined to be EF0 category, and occurred over rural portions of Lee, Charlotte, DeSoto, and Manatee Counties between 3:00 and 6:00 a.m.

August 2, 2001 Tropical Storm Barry: Barry formed in the Gulf of Mexico, adjacent to the Lee County shoreline on August 2, 2001. The storm brought heavy rains to much of Florida, as it moved into the Florida panhandle on August 6, 2001. The storm may have reached Category 1 hurricane status while over the Gulf of Mexico, but was a tropical storm as it struck the Pensacola area. After the 6th, the storm was downgraded to a tropical depression. By the evening of August 8, 2001, the storm had dissipated.

Probability of Future Events

Figure 14 shows the probability of a Category 2 hurricane in Florida, with the extents for the 20, 50, 100 and 300-year return periods.[56] The majority of Lee County is located within the 20-year return period or 20% annual occurrence, with the northern tip within the 50-year return period. From *Figure 15*, the western half of Lee County is within the 500-year return period for a Category 5 hurricane.[57] Based on historic data from the NCEI Storm Events Database, the probability of a land falling hurricane in Lee County for a given year is 1 every 2-3 years. For tropical storms, the probability is 1 every 1-2 years. This does not mean that it is not possible for hurricanes and tropical storms to appear more frequently in Lee County. For instance, Lee County encountered 3 hurricanes in 2004 and 2 in 2005.

[56] 2013 State of Florida Enhanced Hazard Mitigation Plan

[57] Ibid.

Figure 14: Hurricane Category 2 Winds: Probability of Occurrence by Return Period

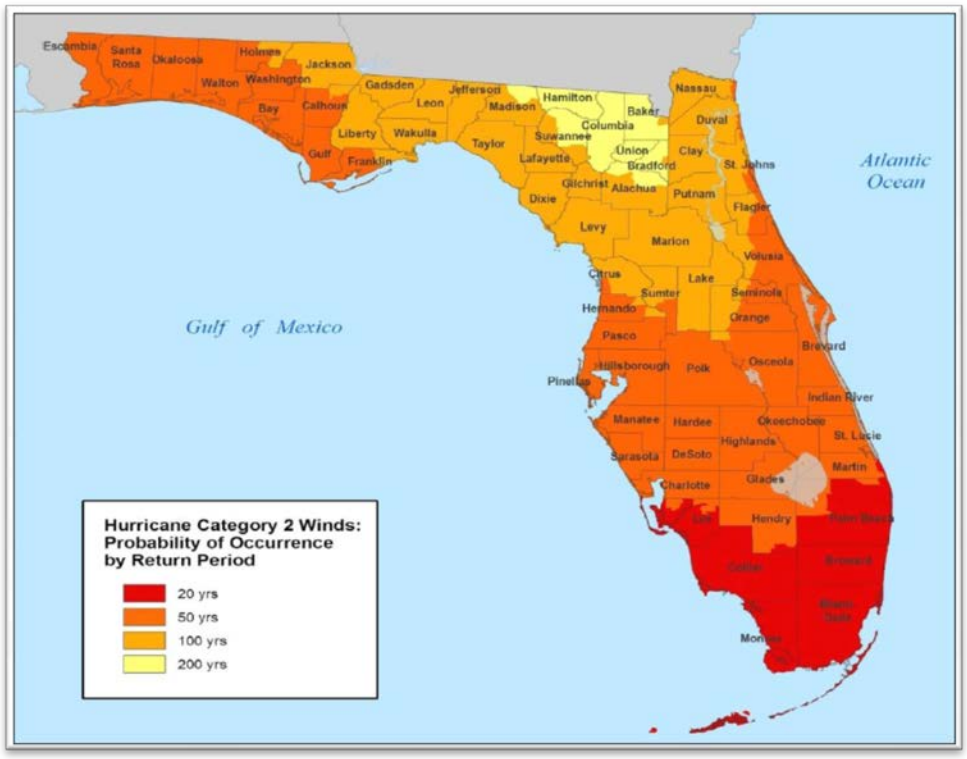
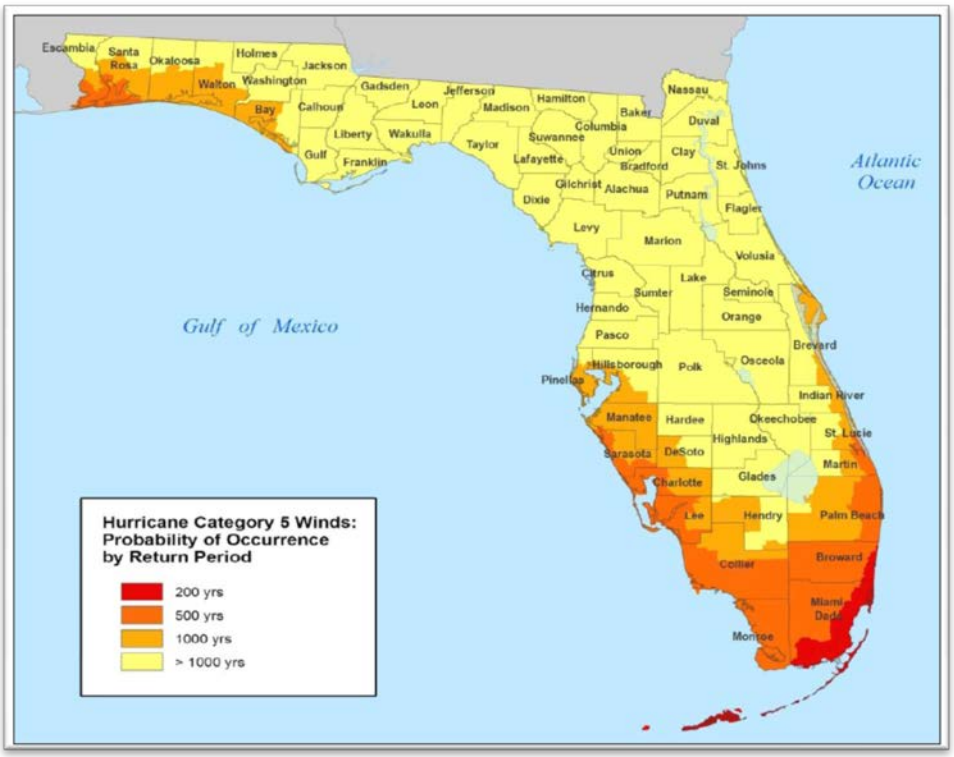


Figure 15: Hurricane Category 5 Winds: Probability of Occurrence by Return Period



Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined hurricane wind damage to be a high priority hazard in Lee County. As described in the profile above, hurricane wind damage events within the county are frequent events with annual probability between 0.5 and 1. Hurricane wind damage events have a high range of impact, accounting for more than $150,000 in annual damages. The probable hazard magnitude for hurricane wind damage is high, including deaths and injuries reported, and one to two days of warning time before an event. Table 36 outlines the hazard rankings for each of the hazard priority criteria related to hurricane wind damage.

Table 36: Hurricane Wind Damage Hazard Priority

		Probable Hazard Magnitude		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
Medium Frequent events with annual probability between 0.5 and 1	High Annual Damages exceeded $150,000	High Deaths and injuries reported	Medium 1 - 2 days	High

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

Hurricane force winds can easily destroy poorly constructed buildings and mobile homes. Debris such as signs, roofing material, and small items left outside become flying missiles in hurricanes. Extensive damage to trees, towers, water and underground utility lines (from uprooted trees), and fallen poles cause considerable disruption.[58]

High-rise buildings are also vulnerable to hurricane force winds, particularly at the higher levels since wind speed tends to increase with height. Recent research suggests you should stay below the tenth floor but still above any floors at risk for flooding. It is not uncommon for high-rise buildings to suffer a great deal of damage due to windows being blown out. Consequently, the areas around these buildings can be very dangerous.[59]

The NCEI Storm Events data was annualized by taking the total number of damaging hurricane events and dividing by the length of record. The annualized values should only be utilized as an estimate of what can be expected in a given year. Using historical records, it can be estimated that Lee County will experience at least 0.71 events every year. Damages from these events can be expected in the magnitude of $127,000,000 for property and $602,000 for crop damages annually. *Table 37* shows the annualized results for hurricane wind events in Lee County.

Table 37. Annualized Damages from Hurricane Wind Events

Annualized Events	Annualized Property Damage	Annualized Crop Damages
0.71	$127,000,000	$602,000

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

[58] Florida Statewide Regional Evacuation Study Program
http://www.swfrpc.org/content/Emergency_Mgmt/SRESP/V1_C2_Hazards_Analysis.pdf

[59] Ibid.

Thunderstorm Winds/Lightning/Hail

Description

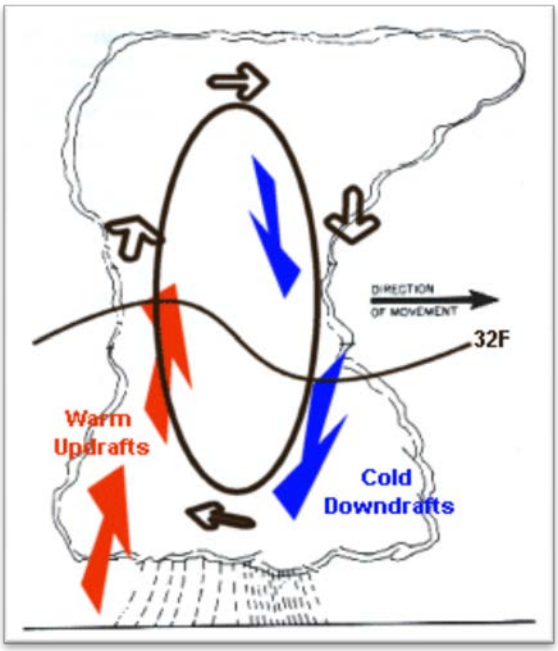
Thunderstorms are the result of warm, moist air that is push upwards into the atmosphere where it cools and forms into cumulonimbus clouds. As the air continues to cool, it starts to form water droplets or ice. As these droplets or ice start to fall, they may collide and combine many times into larger forms before reaching the Earth's surface. Also, these more severe storms are associated with the presence of strong winds, thunder, and lightning. It is also possible to experience these storms with no precipitation which can cause wildfires to occur. Thunderstorms can form in any geographic region, and are sometimes the cause of other natural phenomena such as downburst winds, heavy rain, flash floods, large hailstones, tornadoes, and waterspouts.

A severe thunderstorm includes damaging winds greater than 58 mph (50 knots) or greater and hail 1 inch or larger in diameter. High winds have been further broken down into three categories by the NWS Storm Events database:

- High Wind: Sustained non-convective winds of 35 knots (40 mph) or greater lasting for 1 hour or longer or winds (sustained or gusts) of 50 knots (58 mph) for any duration (or otherwise locally/regionally defined), on a widespread or localized basis. In some mountainous areas, the above numerical values are 43 knots (50 mph) and 65 knots (75 mph), respectively.
- Strong Wind: Non-convective winds gusting less than 50 knots (58 mph), or sustained winds less than 35 knots (40 mph) resulting in a fatality, injury, or damage.
- Thunderstorm Wind: Winds, arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 50 knots (58 mph), or winds of any speed (non-severe thunderstorm winds below 50 knots) producing a fatality, injury, or damage. Events with maximum sustained winds or wind gusts less than 50 knots (58 mph) should be entered as a Storm Data event only if they result in fatalities, injuries, or serious property damage.

Hail is precipitation in the form of ice that occurs in thunderstorms between currents of rising air (updrafts) and currents of descending air (downdrafts) as shown in Figure 16. These events typically occur in late spring and early summer. One criteria for severe thunderstorms, as defined by the NWS, is hail that is 1 inch in diameter (quarter-size) or larger. *Figure 16* is a diagram that shows how hail is formed in the atmosphere.

Figure 16: Formation of Hail (Source: NOAA)



Lightning is generated by the buildup of charged ions in a thundercloud. When this buildup intersects with the best conducting object or surface on the ground, the result is a discharge of a lightning bolt. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder.

Location and Extent

All of Lee County could potentially be impacted by a thunderstorm event that causes high wind, lightning, and hail. All structures and assets in Lee County should be considered vulnerable to these hazards.

Using the NWS definition for a severe thunderstorm, dime-sized hail is considered a minimum hazard and quarter-sized hail is considered a major hazard. Quarter-sized hail can cause significant damage to agricultural crops and livestock, as well as property such as automobiles, aircraft, and roofs. Damage to shingled roofs may go undetected until leaks and cracks start forming. Damage to metal roofs is more noticeable due to dents and damages to exterior finishes. Automobiles may be dented or have their windshields and windows shattered. Although rare, large hailstones may even cause injury or death. The amount of cover obtained during a hail storm can greatly reduce the risk to human health during these events.

While there is no established index for lightning, a lightning strike is considered to be of minimum severity when it has limited impacts on infrastructure (ex. tree limbs) and major severity when it causes extensive damage (ex. Loss of life, fire, structural damage). The potential damages resulting from lightning strikes are primarily loss of life, business interruption, fire and minor structural damage. A false sense of security often leads people to believe that they are safe from a lightning strike because it may not appear to be near their location. However, lightning can strike 10 miles away from a rain column, which puts people that are still in clear weather at risk.

Using the NWS high wind categories listed above, sustained non-convective winds of 40 mph or greater lasting for 1 hour or longer or winds (sustained or gusts) of 58 mph for any duration, on a widespread or localized basis are considered a minimum severity event. A major severity event would be wind events of greater than 58 mph or wind events resulting in death, injury or significant damage.

Based on past history and previous occurrences, all areas of Lee County are equally at risk to this hazard and will continue to be at risk in the future.

Previous Occurrences

As shown in *Table 1*, there have been 2 federal disaster declarations related to severe storms in Lee County. There have been 209 reports of thunderstorms since 1950, when the National Weather Service began keeping track of these occurrences. Damages recorded for these events include $564 thousand dollars of annual total damages; not all damages or events are captured in the National Weather Service data so this is likely a conservative dollar figure than actual damages.

There have been 209 thunderstorm wind events, 51 Lightning strikes and 111 Hail events recorded in Lee County according to the NCEI Storm Events Database. The likelihood and potential severity of thunderstorm/lightning/hail events can be assessed by reviewing the number and severity of thunderstorm events that have occurred in Lee County's history. Of the 209 thunderstorm wind events, 109 did not have a recorded magnitude within the NCEI database. Of the remaining 100 recorded events, the recorded wind speeds varied from 35 to 70 miles per hour (mph). *Table 38* shows the distribution of events by recorded wind speed, where the maximum wind speeds for an average Thunderstorm are in the range of 50 to 55 mph.

Table 38: Frequency of Thunderstorm Wind Events

Wind Speed (mph)	Number of Events
Not Recorded	109
35-40	7
40-45	12
45-50	24
50-55	28
55-60	17
60-65	7
65-75	5
Total Events:	209

Probability of Future Events

The probability of future occurrences of thunderstorms within Lee County is high. It is extremely difficult to determine probability of future occurrence in a specific area with any degree of accuracy. All areas within Lee County are equally at risk to thunderstorms. Based on past occurrences, Lee County has a high probability of future occurrence with an average occurrence of 6.2 events per year.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined thunderstorms to be a high priority hazard in Lee County. As described in the profile above, thunderstorm events within the county are frequent events with an annual probability of greater than 1.0. Thunderstorm events have a high range of impact, accounting for annual damages in excess of $150,000. The probable hazard magnitude for Thunderstorms ranges medium to high, with multiple deaths and injuries reported, and one to two days of warning time before an event. Table 39 outlines the hazard rankings for each of the hazard priority criteria related to thunderstorms.

Table 39: Thunderstorms Hazard Priority

		Probable Hazard Magnitude:		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
High Common events with annual probability > 1.0	High Annual Damages exceeded $150,000	High Deaths and Injuries reported	Medium 1 - 2 days	High

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

The impact of thunderstorms (including lightning and hail) can be measured in financial terms, as well as fatalities and injuries. The NCEI Storm Events data was annualized by taking the total number of damaging thunderstorm events and dividing by the length of record. The annualized values should only be utilized as an estimate of what can be expected in a given year. Using historical records, it can be estimated that Lee County will experience at least 6.2 events every year. Damages from these events can be expected in the magnitude of $564,000 for property and $52 for crop damages annually. *Table 40* shows the annualized results for thunderstorm events in Lee County.

Table 40: Annualized Damages from Thunderstorm Events

Hazard Type	Annualized Events	Annualized Property Damage	Annualized Crop Damages
Thunderstorm Winds/Lightning/Hail	6.2	$564,000	$52

The primary hazard caused by thunderstorm winds is the transport of debris, which can cause casualties and property loss or even the dislodging of mobile homes from their structures or vehicles. High winds may also cause damage to poles and lines carrying electric, telephone, and cable television service. Older structures built before 1940 could be more susceptible to wind damage.

Older critical facilities are vulnerable to wind damage due to the age of construction and possible poor condition, especially in the more rural and isolated areas of the County. It is important to identify specific critical facilities and assets that are most vulnerable to the hazard. Evaluation criteria include the age of the building (and what building codes may have been in effect at the time of construction), type of construction, and condition of the structure (i.e., how well the structure has been maintained).

Figure 17 shows recorded locations of historic hail events and *Figure 18* shows the recorded locations of historic high wind events within Lee County.

Figure 17: Recorded Hail events within Lee County, FL

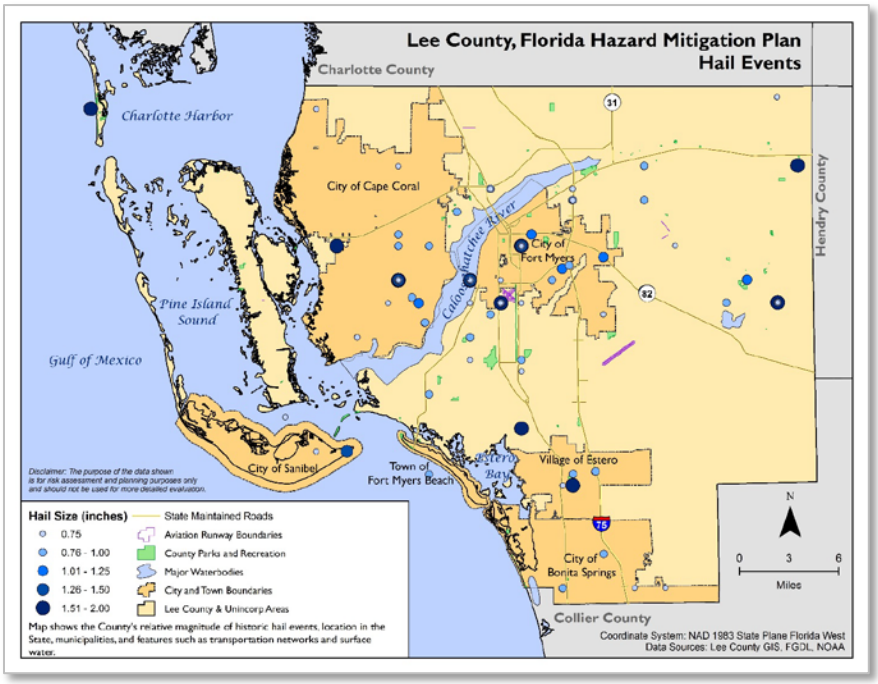
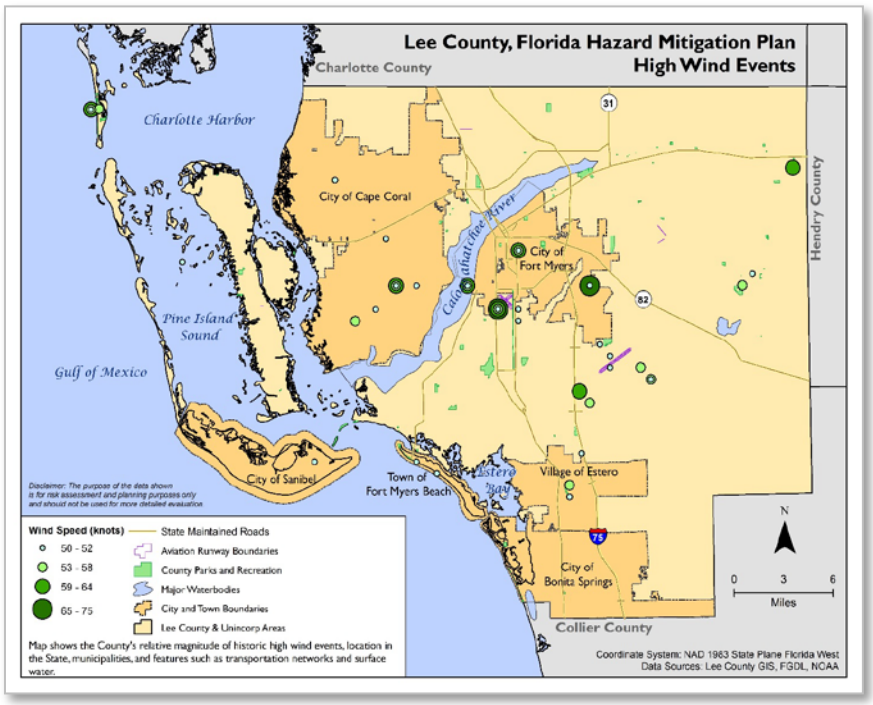


Figure 18: Recorded High Wind events within Lee County, FL



See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Tornado

Description

A tornado is described as a violently rotating column of air extending from a thunderstorm to the ground. The path width of a tornado is generally less than half of a mile, but the path length can vary from a few hundred yards to dozens of miles. A tornado moves at speeds from 30 to 125 mph, but can generate winds exceeding 300 mph.

Tornado season typically is March through August; however, a tornado can occur in any month. Tremendous destruction can occur in paths over a mile wide and 50 miles long with winds reaching 300 mph. In the United States, tornadoes have been classified on the Fujita Scale, assigning numeric scores from zero to five (or higher) based on the severity of observed damages. The traditional Fujita scale, introduced in 1971, was used to rate the intensity of tornadoes thereafter, and was also applied to previously documented tornadoes. Starting in February of 2007, an "enhanced" Fujita scale was implemented, with somewhat lower wind speeds at the higher F-numbers, and more thoroughly-refined structural damage indicator definitions. *Table 41* shows the differences between the old and new tornado intensity scales, wind speeds, typical damages, and frequency.

Table 41: Tornado Damage Scale (Source: NOAA Storm Prediction Center)

Enhanced Operational Fujita Scale	Wind Speeds (mph)	F-Scale	Wind Speeds (mph)	Damage	Frequency
EF0	65 to 85	F0	40 to 72	Light Damage. Some damage to chimneys, TV antennas, roof shingles, trees, and windows	29%
EF1	86 to 110	F1	73 to 112	Moderate Damage. Automobiles overturned, carports destroyed, trees uprooted	40%
EF2	111 to 135	F2	113 to 157	Considerable Damage. Roofs blown off homes, sheds and outbuildings demolished, mobile homes overturned	24%
EF3	136 to 165	F3	158 to 206	Severe Damage. Exterior walls and roofs blown off homes. Metal buildings collapsed or severely damaged. Forests and farmland flattened.	6%
EF4	166 to 200	F4	207 to 260	Devastating Damage. Few walls, if any, standing in well-built homes. Large steel and concrete missiles thrown far distances.	2%
EF5	Over 200	F5	261 to 318	Incredible Damage. Homes leveled with all debris removed. Schools, motels, and other larger structures have considerable damage with exterior walls and roofs gone. Top stories demolished.	Less than 1%

Tornadoes are one of nature's most violent storms. In an average year, about 1,000 tornadoes are reported across the United States, resulting in 80 deaths and over 1,500 injuries. Tornadoes have the potential of creating total

destruction of homes, especially mobile homes, businesses, and cars, causing many deaths; extensive tree damage along roadways, which may inhibit or block access; extensive damage to electric and telephone lines; utility line breaks; damaged or destroyed radio and television towers. Tornadoes are hazard events that threaten everyone in Lee County.

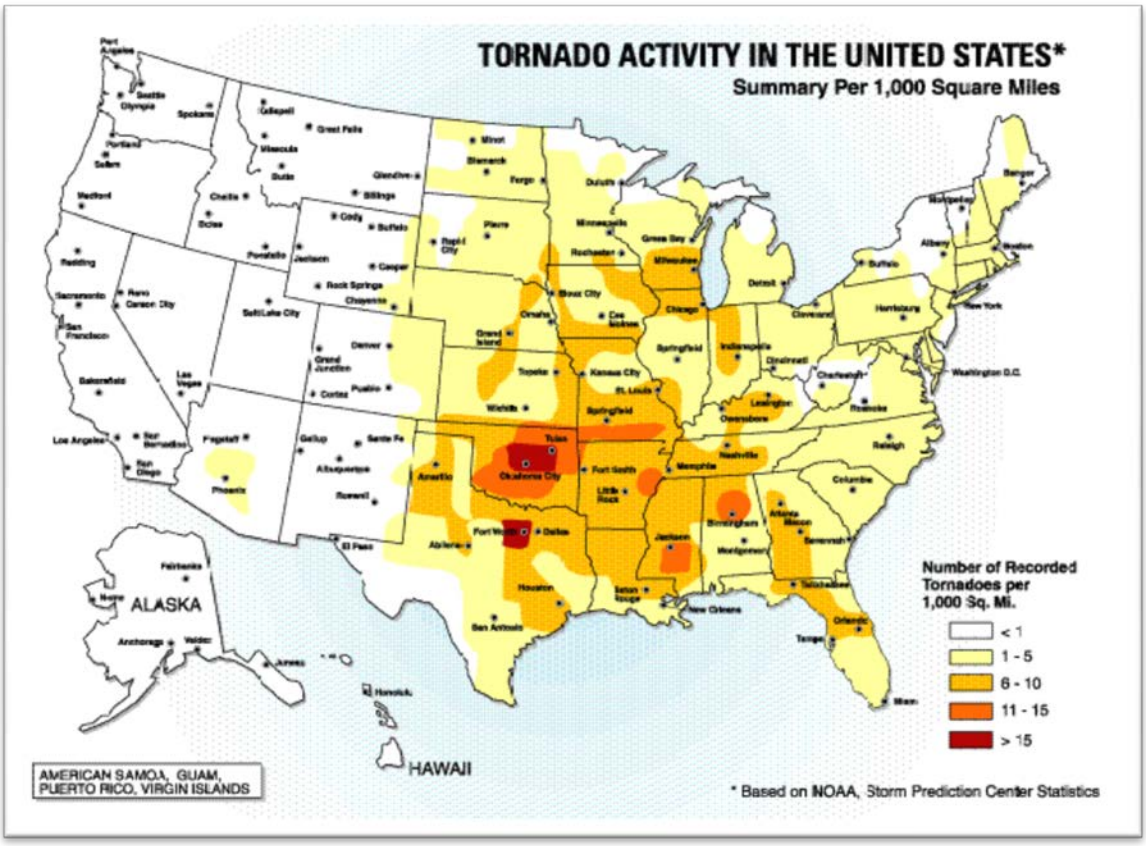
Location and Extent

Lee County may experience tornadoes ranging from EF0, minimum severity and upward to EF4. Readings of EF1 and above would be considered a major severity. *Figure 19* summarizes tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

Buildings must be designed to withstand both external and internal wind pressures on the structural framing and exterior elements. The level to which these structures are designed, as expected, directly correlates with its ability to resist damages due to high winds. The community's building code dictates the design wind speed to which a structure must be designed; Lee County has adopted the International Building Code. For some building types, the structures constructed subsequent to the adoption of the building code are the most likely to be the most resistant to damages from wind.

The damages resulting from tornadoes are affected by the condition of the exposed structures, their design and construction, and the quality of the building materials. The current building code requires structures to be built to withstand a 90 mph (in a 3 second wind burst) wind events. However, structures within the county were built prior to the adoption of the current building code and current standards. As such older homes, certain construction materials, mobile homes, and poorly designed homes are very vulnerable to tornadoes. If homes are destroyed by tornadoes this would impact residents by requiring them to rebuild to current standards or relocate. Destruction of commercial buildings and infrastructure would cause employees to search for employment elsewhere, resulting in relocating to other areas outside of Lee County.

Figure 19: Tornado activity in the United States Source: American Society of Civil Engineers



Vulnerability to tornadoes is dependent on the geographic extent and magnitude of the event. Damages from lower intensity tornadoes (EF0) can range from chimney damage to uprooted shallow trees. A significant tornado (EF2) would cause considerable damage to roofs on frame houses, complete destruction of mobile homes and large trees and utility lines snapping. In Lee County, there are 189 mobile home parks that are at risk of damage from tornados and other related high wind events. *Table 42* summarizes the total mobile home parks by jurisdiction and *Figure 20* shows the location of these parks in Lee County. A devastating tornado (EF4) would result in well-constructed houses being leveled, weak foundations blown to a distance and cars thrown.

Figure 20: Mobile Home Parks in FEMA Flood Zones in Lee County

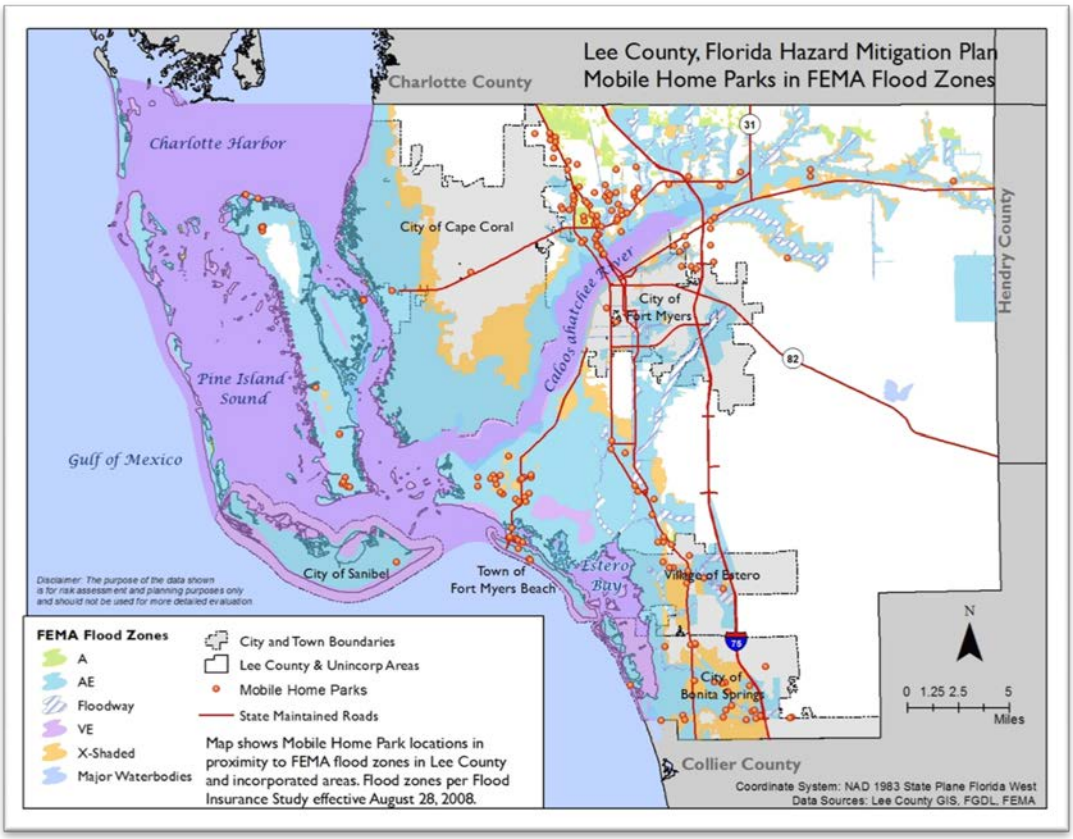


Table 42: Total Mobile Home Parks by Jurisdiction in Lee County

Jurisdiction	Total
City of Bonita Springs	25
City of Cape Coral	1
City of Fort Myers	3
Town of Fort Myers Beach	3
City of Sanibel	1
Unincorporated County	146
Village of Estero	10
Total	189

Previous Occurrences

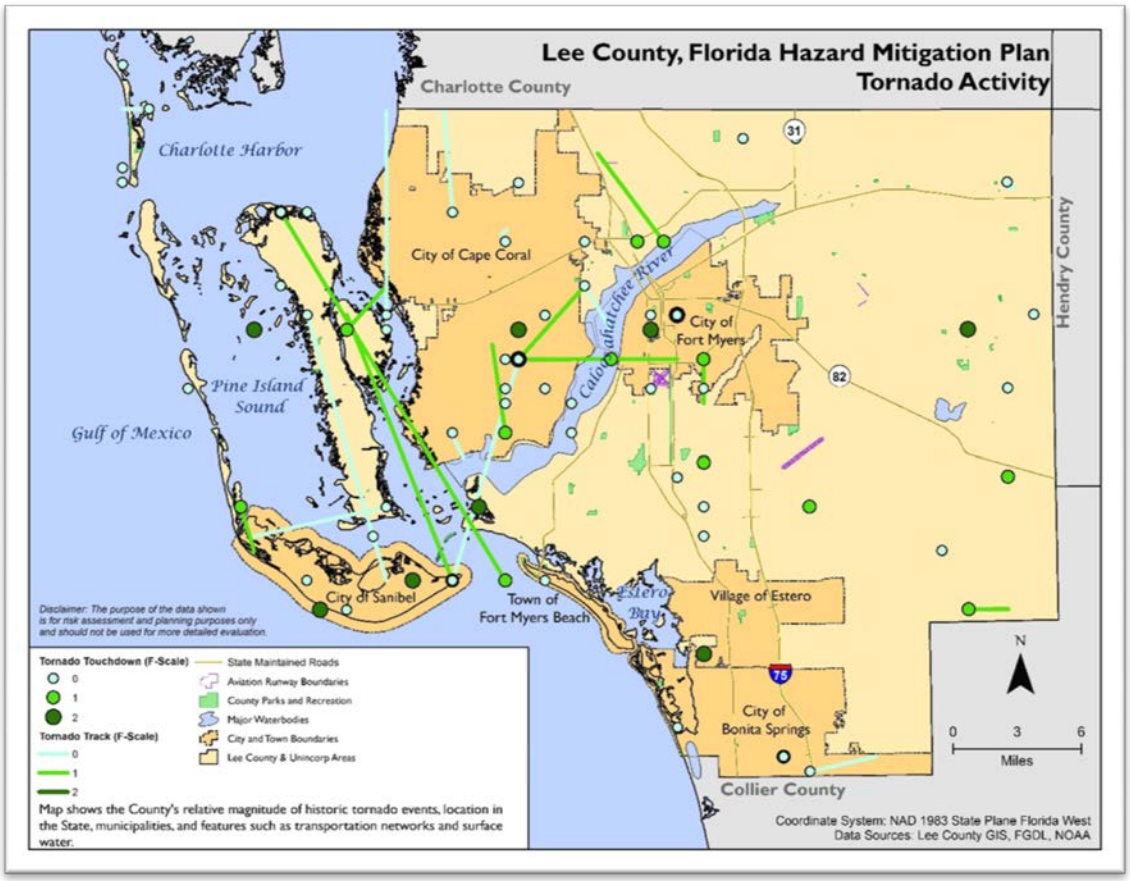
There has been a total of 108 tornadoes and 31 waterspouts in Lee County according to the NCEI since 1950 (*Table 43*). There is no recorded history of a tornado with a classification greater than F2 striking in Lee County. Of the tornado events that have occurred in Lee County, 68.5% of them were F0 tornadoes and 20.4% of them were classified as F1 tornadoes. The majority of the tornado events that occur in Lee County are events that are likely to cause only moderate damage. *Figure 21* shows the historical touchdowns and tracks of tornados in Lee County.

Table 43: NCEI Tornado Events (1950 – 2016)

Tornado Category	Classification	Number of Events
F0	Gale Tornado (40 – 72 mph)	74
F1	Moderate Tornado (73 – 112 mph)	22
F2	Significant Tornado (113 – 157 mph)	12
F3	Severe Tornado (158 – 206 mph)	0
F4	Devastating Tornado (207 – 260 mph)	0
F5	Incredible Tornado (261 – 318 mph)	0
Waterspouts	Weak tornado that forms over water	31
Total		139

Source: National Climactic Data Center of NOAA – Storm History for the Country

Figure 21: Tornado Activity



Probability of Future Events

The NWS advises that tornadoes strike randomly, so all areas within Lee County are equally at risk. Tornado and high-wind events could occur at any time of the year, but are more frequent in the springtime. Based on the NCEI historical records of tornado activity in Lee County, it is estimated that the county will experience about 2 tornado events in any given year.

On the basis of 40 years of tornado history and more than 100 years of hurricane history, the United States has been divided up into four zones that geographically reflect the number and strength of extreme windstorms Zone IV has experienced the most and strongest tornado activity. Zone III has experienced significant tornado activity and includes coastal areas that are susceptible to hurricanes. Lee County is included in Zone III, as most tornados are the result of hurricane weather.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined tornado to be a high priority hazard in Lee County. As described in the profile above, tornado events within the county are common events with an annual probability greater than 1.0. Tornado events have a high range of impact, accounting for annual damages in excess of $150,000. The probable hazard magnitude for tornado is high, including multiple deaths and injuries reported, and less than 24 hours of warning time before an event. *Table 44* outlines the hazard rankings for each of the hazard priority criteria related to Tornado events.

Table 44: Tornado Hazard Priority

		Probable Hazard Magnitude:		
Probability Score	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
High Common events with annual probability > 1.0	High Annual Damages exceeded $150,000	High Deaths and Injuries reported	High Less than 24 hours	High

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

Tornadoes are high-impact, low-probability hazards whose effect is dependent on its intensity and the vulnerability of development in its path. Tornado vulnerability is based on building construction and standards, the availability of shelters or safe rooms, and advanced warning capabilities. Even well-constructed buildings are vulnerable to the effects of a stronger (generally EF-2 or higher) tornado. Identifying assets at risk for tornado damage is virtually impossible because tornadoes are so unpredictable. However, it can be assumed that every structure has an equal chance of exposure to a tornado event. Therefore, all of the assets of Lee County should be included.

Buildings must be designed to withstand both external and internal wind pressures on the structural framing and exterior elements. The level to which these structures are designed, as expected, directly correlates with its ability to resist damages due to high winds. The community's building code dictates the design wind speed to which a structure must be designed. For some building types, the structures constructed subsequent to the adoption of the building code are the most likely to be the most resistant to damages from wind.

The damages resulting from tornadoes are affected by the condition of the exposed structures, their design and construction, and the quality of the building materials. Older homes, certain construction materials, mobile homes, and poorly designed homes are very vulnerable to tornadoes. If homes are destroyed by tornadoes this would impact residents by requiring them to rebuild to current standards or relocate. Destruction of commercial buildings and infrastructure would cause employees to search for employment elsewhere, resulting in relocating to other areas outside of Lee County.

Vulnerability to tornadoes is dependent on the geographic extent and magnitude of the event. Damages from lower intensity tornadoes (EF0) can range from chimney damage to uprooted shallow trees. A significant tornado (EF2) would cause considerable damage to roofs on frame houses, complete destruction of mobile homes and large trees and utility lines snapping. A devastating tornado (EF4) would result in well-constructed houses being leveled, weak foundations blown to a distance and cars thrown.

A generalized loss estimate for the county was derived from NCEI Storm Events data. The data was annualized by taking the total number of damaging tornado events and dividing by the length of record. The annualized values should only be utilized as an estimate of what can be expected in a given year. Using historical records, it can be estimated that Lee County will experience at least 2.1events every year. Annual damages from these events can be expected to be about $951,000 for property and $0 for crops. There are also 0.02 annual deaths expected (2 every 100 years) and 0.52 annual injuries (52 every 100 years.

Table 45 shows the annualized results for tornado events in Lee County.

Table 45: Annualized Damages from Tornado Events

Annualized Events	Annualized Property Damages	Annualized Crop Damages	Annualized Deaths Reported	Annualized Injuries Reported
2.1	$951,000	$0	0.02	0.52

As evidence in property loss figures, tornadoes have the potential to be very destructive. The NCEI estimates are believed to be an underrepresentation of the actual losses experienced due to hazards, as losses from events that go unreported or that are difficult to quantify are not likely to appear in the NCEI database.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Wildfire

Description

A wildfire is an undesirable fire occurring in the natural environment and is a serious and growing hazard throughout the United States. Fires within forested areas that are ignited by natural causes such as lightning or as part of a controlled burn process are part of the natural fire cycle and an important contributor to forest health.

Wildfires pose a great threat to life and property, particularly when they move from forest or rangeland into developed areas. An average of 5 million acres burn every year in the U.S. as a result of wildfires, causing millions of dollars in damage. Each year more than 100,000 wildfires occur in the U.S., almost 90% of which are started by humans; the rest are caused by lightning. Weather is one of the most significant factors in determining the severity of wildfires.

Wildfires can be classified as uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures for areas greater than one acre. Wildfires may create additional environmental concerns well after they are extinguished such as increased erosion and water quality concerns in storm water runoff.

Three main factors influence wildfire behavior – topography, fuel, and weather. Other hazards can contribute to the potential for wildfires or can influence wildfire behavior. High winds can down power lines; earthquakes can rupture gas lines; lightning can spark fires. Lightning is a major cause of structural fires and wildfires.

Drought conditions increase wildfire potential by decreasing fuel moisture. Warm winters, hot, dry summers, severe drought, insect and disease infestations, years of fire suppression, and growth in the wildland-urban interface (WUI) continue to increase wildfire risk and the potential for catastrophic wildland fires. Forest insect epidemics and forest parasites contribute to wildfire potential by increasing fuel loading.

Protecting the WUI is the nation's fastest-growing firefighting expense. In 2007, suppressing wildfires in the WUI accounted for 85% of firefighting costs in the United States. Protecting life and property in these areas is costly because fire managers must take an aggressive stand on the ground and from the air.

Wildfires can have disastrous consequences causing damage to residences, commercial buildings, and to timber, grasslands and natural resources. Economic consequences include the cost of suppression, reduced property values, lost sales and business revenues, reduced tourism, and increased water treatment costs. Resources threatened include communities, homes, gas transmission lines, electrical facilities and lines, timber, watershed and recreation areas, and wildlife.

Timber loss and environmental damage frequently result from wildfires. Wildfire poses a significant threat to nearby buildings and populations. Forest damage from thunderstorms may block interior access roads and fire breaks, pull down overhead power lines, or damage pavement and underground utilities, thereby creating heavy fire load and making suppression and response more difficult.

Previous years of low fire activity can increase fuel loading, leading to more fire activity.

Location and Extent

Forested lands and any surrounding urban areas (WUI - wildland-urban interface) are most at risk to fires. Potential risks include destruction of land, property, and structures as well as injuries and loss of life. Although rare, deaths and injuries usually occur at the beginning stages of wildfires when sudden flare-ups occur from high wind conditions. In most situations, however, people have the opportunity to evacuate the area and avoid bodily harm. Financial losses related to wildfires include destroyed or damaged houses, barns, private facilities and equipment, loss of commercial timber supplies, and local and State costs for response and recovery.

Environmental short-term loss caused by a wildland fire can include the destruction of wildlife habitat and watersheds. Long-term effects include reduced access to affected recreational areas, destruction of cultural and economic resources and community infrastructure, and vulnerability to flooding due to the destruction of watersheds. The Wildland Urban Interface (WUI) is the line, area or zone where structures and other human development meet or

intermingle with undeveloped wildland or vegetative fuel[60]. The three types of communities that occur in or around the WUI are:

- Interface Community - The Interface Community exists where structures directly about wildland fuels. There is a clear line of demarcation between residential, business, and public structures and wildland fuels. The development density for an interface community is usually 3 or more structures per acre or a population density of 250 or more people per square mile, with shared municipal services.
- Intermix Community - The Intermix Community exists where structures are scattered throughout a wildland area. There is no clear line of demarcation; wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres or a population density in between 28-250 people per square mile.
- Occluded Community - The Occluded Community generally exists in a situation, often within a city, where structures abut an island of wildland fuels (e.g., park or open space). There is a clear line of demarcation between structures and wildland fuels. The development density for an occluded community is usually similar to those found in the interface community, but the occluded area is usually less than 1,000 acres in size.

In Lee County, it is estimated that 455,694 people or 74 percent of the total project area population (618,635) live within the WUI.[61] *Figure 22* is an example of where human development intermixes with wildland fuels.[62]

[60] Radeloff, V. C., R. B. Hammer, S. I Stewart, J. S. Fried, S. S. Holcomb, and J. F. McKeefry. 2005. The Wildland Urban Interface in the United States. Ecological Applications 15:799-805.

[61] SouthWRAP Summary Report, Southern Wildfire Risk Assessment (extracted 1/13/2017).

[62] Ibid.

Figure 22: The Wildland Urban Interface (WUI) zone

WUI housing density is categorized based on the standard Federal Register and U.S. Forest Service SILVIS data set categories, long considered a de facto standard for depicting WUI. However, in the Southern Wildfire Risk Assessment (SWRA) WUI data the number of housing density categories is extended to provide a better gradation of housing distribution to meet specific requirements for fire protection planning activities. While units of the actual data set are in houses per sq. km., the data is presented as the number of houses per acre to aid with interpretation and use by fire planners.[63]

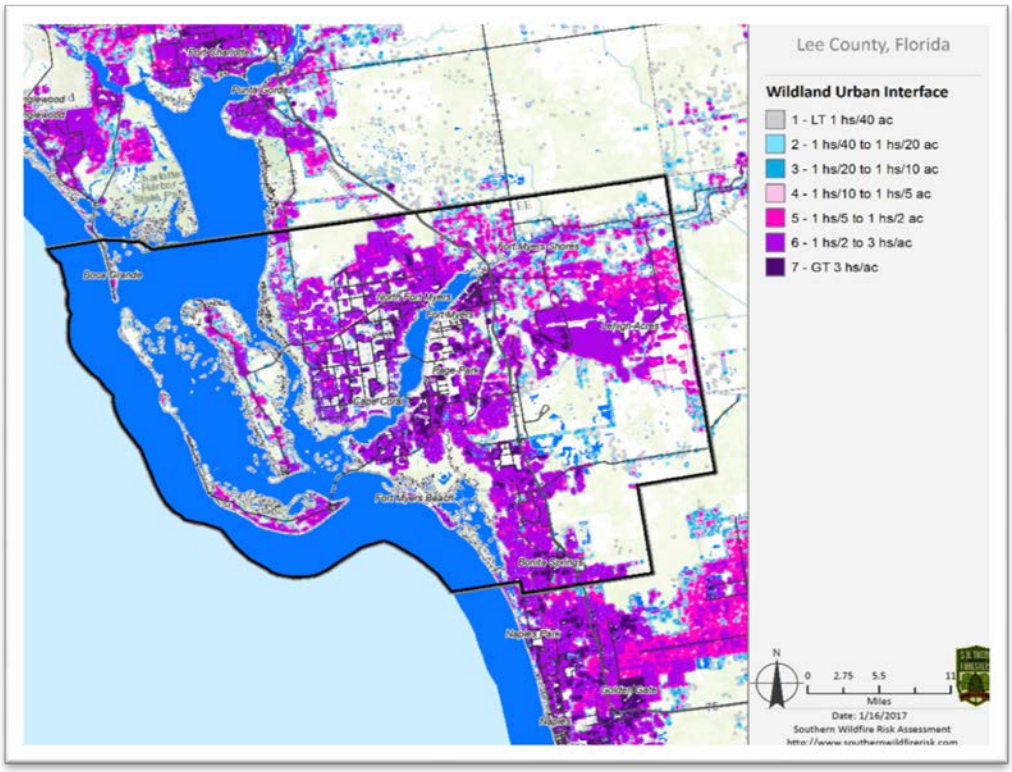
The new SWRA WUI 2012 dataset is derived using advanced modeling techniques based on the SWRA Where People Live (housing density) dataset and 2012 LandScan population count data available from the Department of Homeland Security, HSIP Freedom Data Set. Data is modeled at a 30-meter cell resolution, which is consistent with other SWRA layers. The following figure shows the total population for each WUI area within the project area.[64]

Figure 23 shows the WUI zones within Lee County. With the majority of Lee County's landmass being heavily wooded, wildfires will continue to be routine occurrences. As the area continues its fast growth in both population and structures, the potential for urban interface wildfires will increase.

[63] Ibid.

[64] Ibid.

Figure 23: Lee County, Florida Wildland Urban Interface (WUI)



Previous Occurrences

Each year, thousands of acres of forests and many homes are destroyed by fires that can erupt at any time of the year from a variety of causes, including arson, lightning and debris burning. Adding to the fire hazard is the growing number of people living in new communities built in areas that were once brush or forest. As of April 2014, Florida had 672 state and 14 Federal wildfires burning a total of 10,264 acres statewide.

According to the NOAA NCEI Storm Events Database, there have been a total of 16 wild/forest fire events officially reported in Lee County between March 21, 1999 and January 31, 2004. These events resulted in no deaths or injuries. However, they did cause an estimated $775 thousand in property damage.

In 2006, a wildfire caused significant damage in the Lehigh Acres area and in 2008, Cape Coral experienced a large wildfire in the urban interface area. Wildland fires requiring limited protective actions (evacuations and sheltering) have occurred fairly frequently and will continue to occur in the future. These more limited incidents are not described in this document.

Several significant events include:

June 28, 2008 Cape Coral: Lightning ignited a fire between Sand Road and 40th Street on the 27th that was contained but flared up into a 2,000 acre fire on the 28th. The 5-mile-long and 1 mile wide fire was the largest in Cape Coral's history and led to the evacuation of residents and the closure of 6 miles stretch of Burnt Store Road.

About 22 fire departments and 123 firefighters battled the blaze which came within 60 feet of eight homes in Sanctuary Estates. Much of the land that burned was in a protected area. No injuries or damage to structures were reported.

April 28, 2006 Lehigh Acres: A wildfire consumed 1,875 acres over a three-day period, destroying sixteen homes and damaged 25 other homes. Many cars, boats and recreational vehicles were lost and damaged as well.

May 15, 2000 North Fort Myers: A wildfire consumed nearly 100 acres of scrub tree and brush in North Ft. Myers. An outbuilding and travel trailer were also consumed by the wildfire.

April 9, 2000 Cape Coral: Wildfires burned more than 150 acres of brush and scrub trees in Cape Coral.

April 3, 2000 Fort Myers: Wildfires ignited and burned more than 30 acres and destroyed one out building in San Carlos. Wildfires burned two acres of brush and caused $10,000 dollars in damage to an apartment building in Ft. Myers. *Cape Coral:* Wildfires ignited and burned 100 acres of brush and timber.

March 11, 2000 Fort Myers: A wildfire consumed 65 to 70 acres of brush and timber at Palm Creek Road in Ft. Myers.

February 23, 2000 Lehigh Acres: Brush fires destroyed five homes, damaged a dozen others, and seared 600 acres in Lehigh Acres. The fires ignited near Inez and Joan Avenues and spread to Sunshine Boulevard in Lehigh Acres. Four homes were destroyed on 4th, 7th, and 9th Streets east of Terry Avenue in Lehigh Acres. A fifth home was destroyed by fire near Alexander Graham Bell and Jaguar Boulevards in Lehigh Acres.

Probability of Future Events

Drought conditions and other natural disasters increase the probability of wildfires by producing fuel in both urban and rural settings. All jurisdictions within Lee County are vulnerable to Wildfires. The probability of occurrence is estimated to be every 5 years.

The Burn Probability (BP) layer from the SWRA dataset depicts the probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns and fire prevention and suppression efforts. The BP data does not, and is not intended to, depict fire-return intervals of any vintage, nor do they indicate likely fire footprints or routes of travel. Nothing about the expected shape or size of any actual fire incident can be interpreted from the burn probabilities. Instead, the BP data, in conjunction with the Fire Program Analysts FIL layers, are intended to support an actuarial approach to quantitative wildfire risk analysis (e.g., see Thompson et al. 2011). The Burn Probability is shown in *Figure 24* and *Figure 25* for Lee County.

Figure 24: Lee County, Florida Burn Probability - Acres

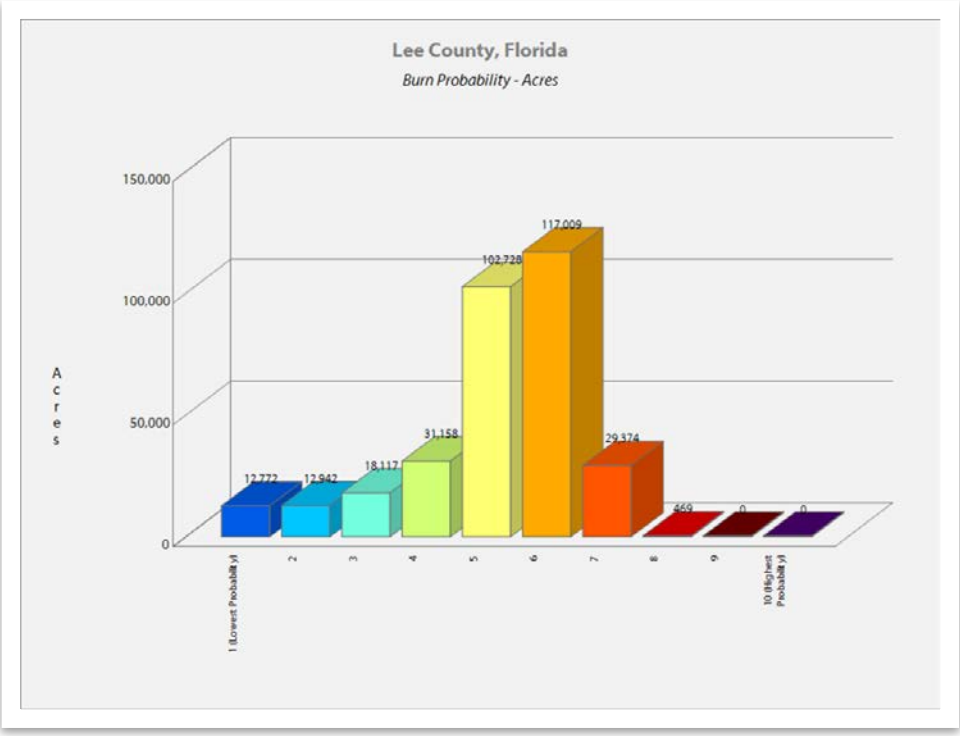
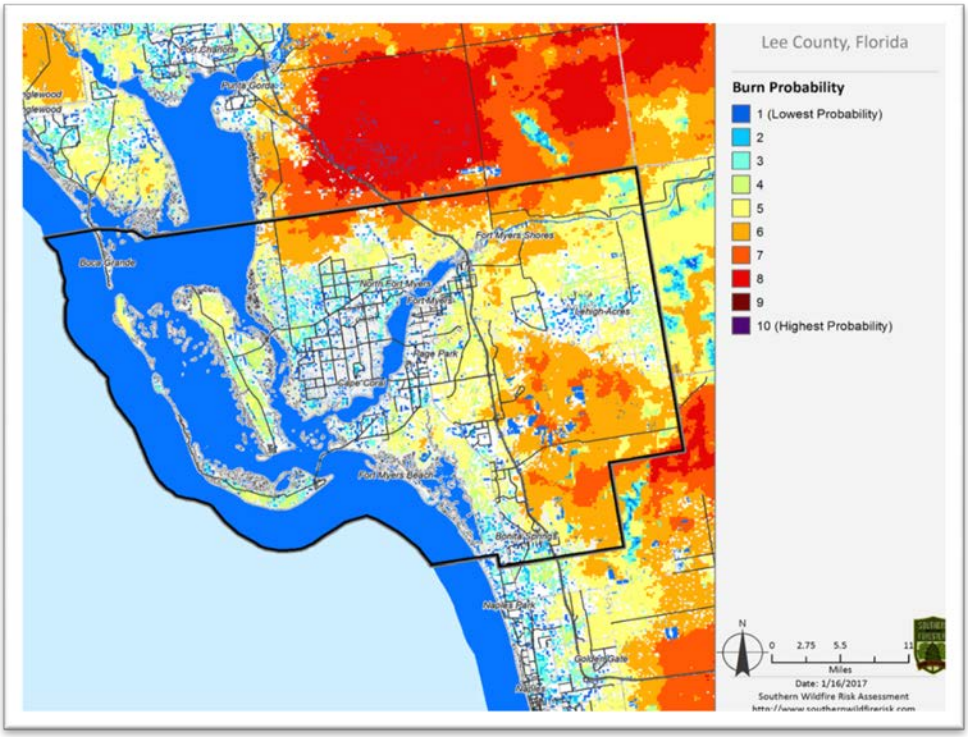


Figure 25: Lee County, Florida Burn Probability



Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined wildfire to be a medium priority hazard in Lee County. As described in the profile above, wildfire events within the county are frequent events with an annual probability between 0.5 and 1. Wildfire events have a medium range of impact, accounting for annual damages between $50,000 and $150,000. The probable hazard magnitude for wildfire ranges from low to high, including no deaths or injuries recorded, and less than 24 hours warning time before events. Table 46 outlines the hazard rankings for each of the hazard priority criteria related to Wildfire.

Table 46: Wildfire Hazard Priority

		Probable Hazard Magnitude		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
Medium Frequent events with annual probability between 0.5 and 1	Medium Annual Damages between $50,000 and $150,000	Low No deaths or injuries recorded	High Less than 24 hours	Medium

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

Demographic change is increasing the size of the WUI, defined as the area where structures and other human development meet or intermingle with undeveloped wildland. The expansion of the WUI in recent decades has significant implications for wildfire management and impact. The WUI creates an environment in which fire can move readily between structural and vegetation fuels. Its expansion has increased the likelihood that wildfires will threaten structures and people.

The WUI is where houses meet or intermingle with wildland vegetation. The WUI is where wildfire poses the biggest risk to human lives and structures. Intermix WUI are areas where housing and vegetation intermingle; interface WUI are areas with housing in the vicinity of contiguous wildland vegetation.

Buildings without fire suppression (i.e., sprinkler systems) are more vulnerable to building fires. If a residence or commercial property were to burn to the ground this would cause significant upheaval in the community.

Many subdivisions were created before standards for emergency ingress and egress were established and may not provide adequate roadways for evacuation or access to burning structures. The difficulty for County planning departments to apply fire-safety regulations to these developments, coupled with the increasing popularity of homes in the WUI has exacerbated the wildland fire risk to these properties.

The NCEI Storm Events data was annualized by taking the total number of damaging wildfire events and dividing by the length of record. The annualized values should only be utilized as an estimate of what can be expected in a given year. Using historical records, it can be estimated that Lee County will experience at least 0.72 events every year. Damages from these events can be expected in the magnitude of $59,700 for property and $0 for crop damages annually. There are no deaths or injuries expected. *Table 47* shows the annualized results for wildfire events in Lee County.

Table 47: Annualized Damages from Wildfire Events

Annualized Events	Annualized Property Damage	Annualized Crop Damages	Annualized Deaths Reported	Annualized Injuries Reported
0.72	$59,700	$0	0	0

An analysis was done using GIS that determined the number of building footprints and critical facilities within each jurisdiction that are in different WUI Risk Index zones in order to highlight areas that may be most affected by wildfires. The WUI Risk Index values range from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact. Table 48 summarizes the total building footprints in each WUI Risk Index zone. There are 209,264 total building footprints in a Risk Index zone (not 0). *Table 49* summarizes the number of critical facilities located within different WUI Risk Index zones. The data shows that the majority of critical facilities are within a Risk Index zone between -7 and -9. *Figure 26* shows the distribution of WUI Risk Index zones throughout Lee County.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Table 48: Building Footprints within WUI Risk Index Zones

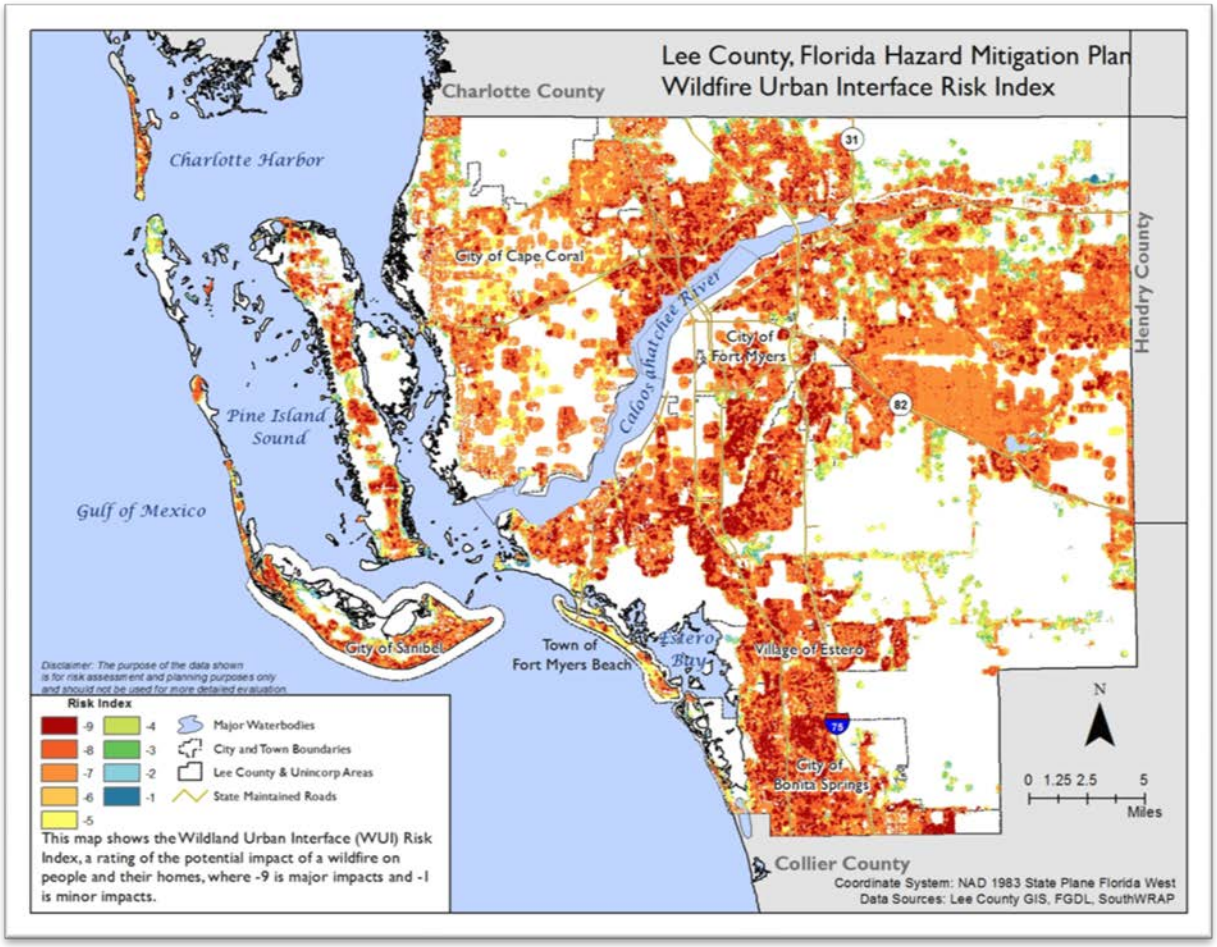
Risk Index	City of Bonita Springs	City of Cape Coral	City of Fort Myers	City of Sanibel	Town of Fort Myers Beach	Unincorporated areas of Lee County	Village of Estero	Total:
-9	6959	1377	3341	994	34	19530	3874	36109
-8	8905	7435	6668	2120	399	40239	7173	72939
-7	4872	21076	4178	1390	635	42901	3762	78814
-6	164	3089	489	29	252	3380	108	7511
-5	414	5848	470	82	1315	4345	322	12796
-4	12	25	213	2	0	325	26	603
-3	9	21	110	4	0	213	34	391
-2	1	2	11	4	0	68	11	97
-1	0	0	0	0	0	4	0	4
0	940	34766	9613	142	661	24864	681	71667
Total:	22276	73639	25093	4767	3296	135869	15991	280931

Table 49: Critical Facilities within WUI Risk Index Zones

Risk Index	City of Bonita Springs	City of Cape Coral	City of Fort Myers	City of Sanibel	Town of Fort Myers Beach	Unincorporated areas of Lee County	Village of Estero	Total:
-9	20	4	16	2	0	70	9	121
-8	31	23	51	16	4	167	18	310
-7	37	44	43	10	3	236	17	390
-6	3	10	16	1	1	21	5	57

Risk Index	City of Bonita Springs	City of Cape Coral	City of Fort Myers	City of Sanibel	Town of Fort Myers Beach	Unincorporated areas of Lee County	Village of Estero	Total:
-5	4	53	6	1	17	59	0	140
-4	1	0	1	1	0	9	1	13
-3	0	2	5	0	0	7	0	14
-2	0	0	2	0	0	2	0	4
-1	0	0	0	0	0	0	0	0
0	1	101	141	0	0	181	5	429
Total:	97	237	281	31	25	752	55	1478

Figure 26: WUI Risk Index for Lee County, FL



Manmade Hazard Profiles

Aircraft Crash

Description

Aircraft crashes can occur for many reasons including mechanical malfunctions, inclement weather, pilot error, or any combination of the previous situations. If a plane were to crash anywhere, it would likely cause severe damage to the plane, the occupants, and the property that it crashed on. Aircraft crashes can occur during any part of a flight. Common causes of accidents include:

- In-flight encounter with weather
- On-ground collision with object
- In-flight collision with object
- Uncontrolled altitude deviation
- Hard landing
- Propeller strike, wing/rotor strike
- Dragged wing or rotor
- Loss of engine power

Most accidents occur as a result of human error. Of these, approximately 50 percent of accidents are due to pilot error, 23 percent are due to personnel not on board, and 12 percent are due to personnel on board. Other accidents occur because of environmental factors, including weather conditions (39 percent), light conditions (12 percent), and terrain conditions (8 percent). Still others occur because of mechanical issues with the airplane. [65]

Aviation collisions and explosions are the deadliest types of accidents. Several collisions have occurred throughout the world. While most aviation accidents are not fatal, almost all result in damage to the airplanes involved. Airplanes can be costly to repair, and loss of function can result in major delays and economic losses for the owners.

Location and Extent

All of Lee County is susceptible to a plane crash with little warning. Of the 11 total airports in Lee County, Southwest Florida International Airport is the largest and Page Field is the second largest airport. There are also 15 heliports and 1 seaplane base in Lee County. Smaller aircraft incidents would be more frequent in Lee County, impact relatively few individuals and have limited financial impacts. Incidents involving larger aircraft, although less frequent, could impact hundreds of individuals, have larger financial impacts and require significant resources.

[65] U.S. Air Carrier Operations Calendar Year 2004. National Transportation Safety Board. http://www.ntsb.gov/publictn/2008/ARC0801.pdf

Previous Occurrences

Florida has had 22 large plane crashes in the state since 1996 that were investigated directly by the National Transportation Safety Board. None of these crashes occurred in Lee County.

Since 2010, there have been two reported small plane crashes of aircraft taking off from or flying though Lee County:

March 9, 2015[66]*:* Two people aboard a Piper Comanche PA-24 had to be cut from the wreckage after it went down near the southwest corner of Colonial Boulevard and US-41. The two adults were conscious and alert while they were being removed from the plane and were then taken to the hospital. The passenger later died a few months later because of injuries related to the crash.

February 7, 2010[67]*:* A light sport aircraft was taking off and the pilot lost control of the plane. The crash caused one runway to shut down for about an hour.

Probability of Future Events

Aircraft crashes are generally considered to be an infrequent event in Lee County with only two reported small plane crashes in the county over the last 6 years. Lee County contains one large international airport and several smaller airports and helipads, so this busy airspace will continue to be at risk of future aircraft crashes.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined aircraft crashes to be a medium priority hazard in Lee County. As described in the profile above, aircraft crash events within the county are infrequent events with an annual probability of less than 0.5. Aircraft crash events have a low range of impact, accounting for less than $50,000 in annual damages to county property. Damages sustained by individuals or corporations could be much more significant. The probable hazard magnitude for aircraft crashes is high, including multiple reported deaths and injuries, and little to no warning time (less than a 24-hour warning time) before an event. Table 50 outlines the hazard rankings for each of the hazard priority criteria related to aircraft crashes.

Table 50: Aircraft Crashes Hazard Priority

		Probable Hazard Magnitude		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
Low Infrequent events with annual probability < 0.5	Low Annual Damages less than $50,000	Medium Injuries but no deaths recorded	High Less than 24 hours	Medium

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

[66] "Plane down near page field two on board." http://www.nbc-2.com/story/28299012/plane-down-near-page-field-two-on-board

[67] "Sport aircraft crashes at Page Field." http://www.nbc-2.com/story/11948118/sport-aircraft-crashes-at-page-field

Page Field (FMY) is a public airport located three miles south of downtown Fort Myers. This airport is categorized as a reliever airport for Southwest Florida International Airport (RSW). Due to its proximity to a city center, Page Field is within 1 mile of 37 critical facilities. These facilities are considered especially vulnerable to aircraft crashes given their proximity to the airport. The eight gas stations within a mile of Page Field are a notable fire hazard if a crash occurred at a station or nearby. With the high number of aircraft arrivals and departures each year from Page Field and Southwest Florida International Airport, Lee County is vulnerable to aircraft crashes.

Table 51: Critical Facilities within 1 Mile of Page Field Airport

Facility Type	Number of Facilities
Emergency Medical Service	2
Fire Station	1
Gas Station	8
Government Building	4
Hazardous Material Site	2
Health Care Facility	3
Landing Zone	1
Law Enforcement	1
School	6
Sewage Treatment Facility	1
Top 100 Employers	6
Transportation Facility	2
Total:	37

The list of some notable airports and heliports, locations, and uses in Lee County are shown in Table 52.

Table 52: Airports and Heliports in Lee County

Type	Site	Use	Location
Airport	Southwest Florida International Airport	Public	Fort Myers
Heliport	Lee County Mosquito Control District Heliport	Institutional	Fort Myers
Airport	Page Field	Public	Fort Myers
Heliport	Lee Memorial Hospital Emergency Heliport	Private	Fort Myers
Airport	Strayhorn Ranch Airport – 47FD	Private	Fort Myers

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Cyberattack

Description

For the purposes of this report, a cyberattack is defined as a malicious computer-to-computer attack through cyberspace that undermines the confidentiality, integrity, or availability of a computer (or network), data on that computer, or processes and systems controlled by that computer. National Security Presidential Directive 54/Homeland Security Presidential Directive 23 (NSPD-54/HSPD¬ 23) defines cyberspace as the interdependent

network of information technology infrastructures, and includes the Internet, telecommunications networks, computer systems, and embedded processors and controllers in critical industries.[68]

Threats to cyber space are regarded as one of the most serious economic and national security challenges in this day in age for the United States. As the Director of National Intelligence (DNI) recently testified before Congress, "the growing connectivity between information systems, the Internet, and other infrastructures creates opportunities for attackers to disrupt telecommunications, electrical power, energy pipelines, refineries, financial networks, and other critical infrastructures."[69]

The duration of a cyberattack is dependent on the complexity of the attack, how widespread it is, how quickly the attack is detected, and the resources available to aid in restoring the system. One of the difficulties of malicious cyber activity is that it could come from virtually anyone, virtually anywhere. *Table 53* and *Table 54* summarizes common types and sources of cybersecurity threats.[70]

Table 53: Common Types of Cyber Attacks

Type of Attack	Description
Botnet	A collection of compromised machines (bots) under (unified) control of an attacker (botmaster).
Denial of service	A method of attack from a single source that denies system access to legitimate users by overwhelming the target computer with messages and blocking legitimate traffic. It can prevent a system from being able to exchange data with other systems or use the Internet.
Distributed denial of service	A variant of the denial of service attack that uses a coordinated attack from a distributed system of computers rather than from a single source. It often makes use of worms to spread to multiple computers that can then attack the target.
Exploit tools	Publicly available and sophisticated tools that intruders of various skill levels can use to determine vulnerabilities and gain entry into targeted systems.
Logic bombs	A form of sabotage in which a programmer inserts code that causes the program to perform a destructive action when some triggering event occurs, such as terminating the programmer's employment.
Phishing	The creation and use of emails and websites designed to look like those of well-known legitimate businesses, financial institutions, and government agencies in order to deceive Internet users into disclosing their personal data, such as bank and financial account information and passwords. Phishers use or sell this information for criminal purposes, such as identity theft and fraud.
Sniffer	Also knows as packet sniffer. A program that intercepts routed data and examines each packet in search of specified information, such as passwords transmitted in clear text.
Trojan horse	A computer program that conceals harmful code. A Trojan horse usually masquerades as a useful program that a user would wish to execute.

[68] Cyberspace Policy Review, Assuring a Trusted and Resilient Information and Communications Infrastructure, U.S. White House.

[69] Director of National Intelligence, Annual Threat Assessment of the Intelligence Community for the Senate Armed Services Committee, Statement for the Record, March 10, 2009, at 39.

[70] United States Government Accountability Office, "Critical Infrastructure Protection: Department of Homeland Security Faces Challenges in Fulfilling Cybersecurity Responsibilities", Report #GAO-05-434 (May 2005), www.gao.gov/new.items/d05434.pdf

Type of Attack	Description
Virus	A program that infects computer files, usually executable programs, by inserting a copy of itself into the file. These copies are usually executed when the infected file is loaded into memory, allowing the virus to infect other files. Unlike the computer worm, a virus requires human involvement (usually unwitting) to propagate.
War dialing	Simple programs that dial consecutive telephone numbers looking for modems.
War driving	A method of gaining entry into wireless computer networks using a laptop, antennas, and a wireless network adaptor that involves patrolling locations to gain unauthorized access.
Worm	An independent computer program that reproduces by copying itself from one system to another across a network. Unlike computer viruses, worms do not require human involvement to propagate.

Table 54: Common Sources of Cybersecurity Threats

Threat	Description
Bot-network operators	Bot-network operators are hackers; however, instead of breaking into systems for the challenge or bragging rights, they take over multiple systems in order to coordinate attacks and to distribute phishing schemes, spam, and malware attacks. The services of these networks are sometimes made available on underground markets (e.g., purchasing a denial-of-service attack, servers to relay spam or phishing attacks, etc.).
Criminal groups	Criminal groups seek to attack systems for monetary gain; specifically, organized crime groups use spam, phishing, and spyware/malware to commit identity theft and online fraud. International corporate spies and organized crime organizations also pose a threat to the United States through their ability to conduct industrial espionage and large-scale monetary theft, and to hire or develop hacker talent.
Foreign intelligence services	Foreign intelligence services use cyber tools as part of their information-gathering and espionage activities; in addition, several nations are aggressively working to develop information warfare doctrine, programs, and capabilities. Such capabilities enable a single entity to have a significant and serious impact by disrupting the supply, communications, and economic infrastructures that support military power—impacts that could affect the daily lives of U.S. citizens across the country.
Hackers	Hackers break into networks for the thrill of the challenge or for bragging rights in the hacker community. While remote hacking once required a fair amount of skill or computer knowledge, hackers can now download attack scripts and protocols from the Internet and launch them against victim sites. Thus, while attack tools have become more sophisticated, they have also become easier to use. According to the Central Intelligence Agency, the large majority of hackers do not have the requisite expertise to threaten difficult targets such as critical U.S. networks; nevertheless, the worldwide population of hackers poses a relatively high threat of an isolated or brief disruption causing serious damage.
Insiders	The disgruntled organization insider is a principal source of computer crime. Insiders may not need a great deal of knowledge about computer intrusions because their knowledge of a target system often allows them to gain unrestricted access to cause damage to the system or to steal system data. The insider threat also includes outsourcing vendors as well as employees who accidentally introduce malware into systems.
Phishers	Individuals or small groups that execute phishing schemes in an attempt to steal identities or information for monetary gain. Phishers may also use spam and spyware/malware to accomplish their objectives.
Spammers	Individuals or organizations that distribute unsolicited email with hidden or false information in order to sell products, conduct phishing schemes, distribute spyware/malware, or attack

Threat	Description
	organizations (e.g., denial of service).
Spyware/malware authors	Individuals or organizations with malicious intent carry out attacks against users by producing and distributing spyware and malware. Several destructive computer viruses and worms have harmed files and hard drives, including the Melissa Macro Virus, the Explore.Zip worm, the CIH (Chernobyl) Virus, Nimda, Code Red, Slammer, and Blaster.
Cyberterrorists	Cyberterrorists seek to destroy, incapacitate, or exploit critical infrastructures in order to threaten national security; cause mass casualties, weaken economies, or target businesses; and/or damage public morale and confidence. Cyberterrorists may use phishing schemes or spyware/malware in order to generate funds or gather sensitive information.

Location and Extent

As most day-to-day activities rely on the Internet in one aspect or another, any person or infrastructure is susceptible to cybersecurity threats. Energy pipelines, specifically U.S. natural gas pipelines, have been cited by DHS as targets of cyberattack. While information on these attacks is not publicly available knowledge, cyber security officials warn that, with sufficient access, a hacker could "manipulate pressure and other control system settings, potentially reaping explosions and other dangerous conditions."[71] While cyber risks and threats are mainly thought of as not having specific locations, there are physical sites that would be impacted. Locations at risk could include government agencies, institutions of higher education, medical facilities and various private sector entities.

Previous Occurrences

In Lee County, there was a recent hacking of the Supervisor of Elections' website in May 2016. A man was caught hacking the website to point out the servers' vulnerability. This attack exposed the vulnerability of an old server; this server was subsequently upgraded.

Cyberattacks are growing in sophistication and have the potential to cause increasing damage to U.S. competitiveness, degrade privacy and civil liberties protections, and undermine national security. Some examples of cyberattacks in recent years that have affected U.S. citizens include:

- CIA reports malicious activities against information technology systems have caused the disruption of electric power capabilities in multiple regions overseas, including a case that resulted in a multi-city power outage.[72]
- In November 2008, the compromised payment processors of an international bank permitted fraudulent transactions at more than 130 auto mated teller machines in 49 cities within a 30-minute period, according to press reports.[73] In another case reported by the media, a U.S. retailer in 2007 experienced data breaches and loss of personally identifiable information that compromised 45 million credit and debit cards.[74]

[71] Florida State Hazard Mitigation Plan, 2013

[72] www.sans.org/newsletters/newsbites/newsbites.php?vol=10&issue=5, CIA presentation, SANS SCADA Security Summit, January 16, 2008.

[73] www.bankinfosecurity.com/article.php?art_id=1197, February 5, 2009.

[74] www.infoworld.com/d/security-central/retailer-tjx/reports-massive-data-breach-952, January 17, 2007.

- Industry estimates of losses from intellectual property to data theft in 2008 range as high as $1 trillion.[75]

Probability of Future Events

Based on the growing sophistication and political climate, there is a high probability of future cyberattack events within Lee County.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined cyberattacks to be a medium priority hazard in Lee County. As described in the profile above, cyberattack events within the county are infrequent events with an annual probability of less than 0.5. Cyberattack events have a low range of impact, accounting for less than $50,000 in annual damages. The probable hazard magnitude for cyberattacks is medium, including no deaths or injuries recorded, and less than a 24-hour warning time before an event. *Table 55* outlines the hazard rankings for each of the hazard priority criteria related to cyberattacks.

Table 55: Cyberattack Hazard Priority

		Probable Hazard Magnitude		
Probability	Maximum Impact	Death and Injury	Warning Time	Composite Hazard Index
Low Infrequent events with annual probability < 0.5	Low Annual Damages less than $50,000	Low No deaths or injuries recorded	High Less than 24 hours	Medium

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

The public is heavily reliant on technology for daily life, including cell phones, handheld devices such as tablets, and computers. Any disruption to this technology caused by a cyberattack could impair the ability for the public to conduct basic activities, such as communications and mobile banking. Property and facilities may become either uninhabitable or unusable as a result of a cyberattack, particularly if their infrastructure if reliant on technology for sustainability. In addition, a significant majority of critical infrastructure systems are in some way tied to technology, oftentimes through virtual operations and supervisory control and data acquisition (SCADA) systems. Therefore, a cyberattack could disable the vast majority of systems which control these pieces of critical infrastructure, as well as traffic control, dispatch, utility, and response systems. Targeted cyberattacks can impact water or wastewater treatment facilities. The disruption of the virtual systems tied to this infrastructure could cause water pollution or contamination and subsequent environmental issues.

Cyberattacks can interfere with emergency response communication and activities. Given that many first responders rely on technology both at operations center and in the field, a cyberattack could impair the ability to communicate.

[75] www.mcafee.com/us/about/press/corporate/2009/20090129_063500_j.html. See also http://resources.mcafee.com/content/NAUnsecuredEconomiesReport, McAfee, "Unsecured Economies: Protecting Vital Information", January 2009. Projection based on survey by Purdue's Center for Education and Research in Information Assurance and Security.

For example, many agencies rely on technology to notify and route responders to the scene of the emergency. More specifically, 911 dispatch centers rely on technology which makes them vulnerable to cyber exploits. In addition, the nebulous nature of a cyberattack makes coordinated response convoluted and complicated.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Hazardous Materials Release

Description

Hazardous materials are widely used or created at facilities such as hospitals, wastewater treatment plants, universities, and industrial/manufacturing warehouses. Several household products such as cleaning supplies and paint are also considered hazardous materials and can be found in households and stores. Hazardous materials include:

- Explosives;
- Flammable, non-flammable, and poison gas;
- Flammable liquids;
- Flammable, spontaneously combustible, and dangerous when wet solids;
- Oxidizers and organic peroxides;
- Poisons and infectious substances;
- Radioactive materials; and
- Corrosive materials.[76]

The release of a hazardous material to the environment could cause a multitude of problems. Although these incidents can happen almost anywhere, certain areas of the County are at higher risk, such as near roadways that are frequently used for transporting hazardous materials and locations with industrial facilities that use, store, or dispose of such materials. Areas crossed by railways, waterways, airways, and pipelines also have increased potential for mishaps. Incidences can occur during production, storage, transportation, use, or disposal of hazardous materials. Communities can be at risk if a chemical is used unsafely or released in harmful amounts into the environment. Hazardous materials can cause death, serious injury, long-lasting health effects, and damage to buildings, the environment, homes, and other property.

The term "release" includes spilling, leaking, pumping, pouring, emitting, emptying, discharging, escaping, leaching, dumping, or disposing into the environment of any hazardous material. Hazardous materials releases (HMRs) may be intentional or accidental, and may occur at fixed facilities or on vehicles.

HMRs are harmful in three ways:

[76] National Archives and Records Administration, "Code of Federal Regulations Title 49: Transportation" (July 1 2012), http://ecfr/gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=54f867044f1c9e1af52443eb305e1360;rgn=div5;view=text;node=49%3A2.1.1.3.7;idno=49;cc=ecfr

1) Life safety concerns. Chemical, biological, and radiological agents can cause significant health risks to those exposed to them; biological agents can be additionally dangerous if they are infectious. Flammable and explosive materials also present life safety concerns if they are exposed to heat.
2) Costly and delicate nature of cleanup. Any release of a hazardous material requires a thorough and careful clean-up of the site and decontamination of those exposed.
3) Operational delays. Delays caused by any HMR and the ensuing evacuation and cleanup processes could lead to significant economic losses due to traffic delays (mobile releases) or operational shut-down (fixed facilities).

Location and Extent

Areas with multiple chemical facilities experience a greater risk of a chemical incident than other locations. However, almost every community in Lee County has at least one facility that stores, produces, or utilizes a hazardous material. Propane installations are located across the state and their presence increases the risk of an incident. Hazardous material shipments move through the county annually; these shipments can occur at any time, day or night, and by means of road, rail, air and water, and often through areas with urbanized, high traffic volume routes.

Hazardous waste/materials spills may be accidental or intentional, and may occur at fixed facilities or during transportation.

Hazardous materials are widely used in public and private facilities and farms. Numerous facilities in Lee County store, use, dispose, or have the capacity and infrastructure to handle hazardous materials on a regular basis; under Title III of the Emergency Planning and Community Right to Know Act, facilities that meet certain requirements must report to federal, state, and local authorities. These facilities are commonly referred to as “Tier I” or “Tier II” facilities. There are 131 Tier II facilities located in Lee County.

Accidental Hazardous Materials Spill

Hazardous materials accidents can range from a chemical spill on a highway to groundwater contamination by naturally occurring methane gas to a household hazardous materials accident[77]. Potential hazards can occur during any stage of use from production and storage to transportation, use or disposal. Production and storage occurs in chemical plants, gas stations, hospitals, and many other sites. There are many reasons an unintentional hazardous waste/materials spill may occur. Some of these include:

- Malfunction of equipment
- Natural disaster
- Accidents caused by humans[78]

Intentional Fixed Facility Hazardous Materials Spill

Hazardous material spills at fixed facilities may be internal or external to the facility. External releases may involve industrial storage, fires, or malicious acts. External releases may create airborne plumes of chemical, biological, or radiological elements that can affect a wide area and last for hours or days. Internal releases occur inside buildings and can be caused by a chemical spill or release of a biological or radiological agent. Internal releases can affect all

[77] University of Idaho Cooperative Extension System, http://www.uiweb.uidaho.edu/disaster/haz/hazmat.html
[78] Innovateus, “What is a Chemical Spill?”, http://www.innovateus.net/earth-matters/what-chemical-spill

occupants of a building, particularly if the material is distributed throughout the building through the heating/ventilation system[79].

Intentional hazardous material releases at fixed facilities:

These intentional releases at fixed facilities might include:

- Deliberate release of a hazardous substance by an employee of a facility that stores or uses hazardous materials or produces hazardous waste;
- Deliberate release of a hazardous substance into the water supply
- Detonation of a "dirty bomb" – an explosive device containing radiological or biological substances that are released into the air upon explosion;
- Redirection of toxic waste into water supply or ventilation system; and
- Delivery or placement of a hazardous material inside a building.

Intentional Mobile Hazardous Materials Spill

Intentional mobile releases may include:

- Release of a chemical, biological, or radiological agent from a moving vehicle or train;
- Use of a vehicle as a dirty bomb, i.e., crashing a vehicle filled with hazardous materials into a structure or building or exploding the vehicle;
- Targeting commercial/industrial chemical containers transported in bulk by both road and rail;
- Release of hazardous materials from airplanes over densely populated areas; and
- Release of hazardous materials into water from a boat.

Previous Occurrences

Accidental HMRs occur frequently at facilities throughout the country—between 2002 and 2007, 43,766 hazardous materials incidents were recorded in only 15 states, including 423 events in schools. The school incidents alone resulted in nearly 900 injuries[80].

The following is a list of HMR events in Lee County:

November 27, 2016: A fuel tanker overturned on a major roadway in Cape Coral, shutting the road down for several hours. The tanker spilled about 9,000 gallons of gasoline all over the road, creating a major fire hazard. Residents living within a half-mile radius of the spill were evacuated from their homes as a precaution[81].

December 13, 2016: Nearly a dozen homes in a community in San Carlos Park were evacuated after a contractor hit a gas line, causing a leak[82].

Some examples of accidental HMRs at fixed facilities are:

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[79] U.S. Air Force, "Protective Actions for a Hazardous Material Release", (22 October 2001), Http://emc.ornl.gov/CSEPPweb/data/Reports/Misc.%20Reports/HAZMAT.pdf

[80] Wattigney, WA and S Everett Jones. "Hazardous Chemical Incidents in Schools—United States, 2002-2007." Morbidity and Mortality Weekly Report, 7 November 2008.

[81] http://www.nbc-2.com/story/33800101/leaking-overturned-fuel-tanker-catches-fire-in-cape-coral

[82] http://www.winknews.com/2016/12/13/homes-evacuated-due-to-lee-county-gas-leak/

December 19, 2007: A chemical plant caught fire in Jacksonville, Florida killing four and injuring at least 14 others. The volatile chemicals and fuel additives produced at the plant made rescue operations difficult, and concern over toxic fumes caused an evacuation of the facility[83].

May 2007: 20 employees of an industrial laundry facility in Vista, California were hospitalized after bleach and sulfuric acid were mixed, releasing chlorine gas[84].

August of 1996: In California, an office building and several school buildings were evacuated after workers noticed an unusual odor and became ill. The odor was determined to be herbicide that had spilled, and the cleanup process took several days[85].

According to best available data at the time of this study, no intentional HMRs have occurred at fixed facilities in Lee County.

United States Department of Transportation Florida State Hazard Mitigation Plan reported 782 total hazardous materials events reported to the State Watch Office from July 2011 to June 15, 2012. Of those events reported, 6.8% involved the evacuation of individuals from the area of impact. Florida has 30,638 miles of pipeline, 91% of which is carrying natural gas. Despite this being an efficient and generally safe means of transporting toxic/volatile material, between 2002 and 2011 there were 36 "serious or significant pipeline incidents" in Florida. This resulted in one fatality, eight injuries, and $8,126,666 in property damage.[86]

Some examples of accidental mobile HMRs that have occurred in the US include:

- At around 4 AM on June 2, 1999, a tractor-trailer carrying 34,000 pounds of highly explosive black powder overturned at a major interchange in Springfield, Virginia. The incident shut down northbound lanes of Interstate 95 and the outer loop of the Beltway, I-495. The incident took approximately 18 hours to resolve, disrupting both morning and afternoon commutes for thousands. No one was killed.[87]
- On June 20, 1998, a train derailed in Cox Landing, West Virginia. Three of the 30 derailed cars were loaded with hazardous materials and leaked a combined volume of about 21,500 gallons of formaldehyde solution. No one was injured during the derailment, though 15 reported injuries as a result of exposure to formaldehyde.[88]

[83] "Florida Chemical Plant Explosion Kills 4." Associated Press. 19 December 2007, http://www.cbsnews.com/stories/2007/12/19/national/main3633135.shtml

[84] "Cleanup Winding Down on Vista Hazmat Incident." North County Times. 11 May 2007, http://www.nctimes.com/articles/2007/05/11/news/top_stories/0_00_000_01_07.txt

[85] Department of Health and Human Services Agency for Toxic Substances and Disease Registry, http://www.atsdr.cdc.gov/HAC/pha/sancarlos/sca_p1.html

[86] Florida State Hazard Mitigation Plan, 2013

[87] Jones, Kenneth L. "Recipe for Disaster." Fire Chief Magazine, 1 August 1999. http://firechief.com/mag/firefighting_recipe_disaster/

[88] Railroad Accident Report. National Transportation Safety Board. Washington, DC, 20 June 1998. http://www.ntsb.gov/publictn/1999/RAR9901.pdf

Probability of Future Events

Most HMRs occur with little or no warning, and can be difficult to detect until symptoms present themselves in those affected. Although major chemical incidents seem most threatening, it is the smaller, more routine accidents and spills that have a greater impact on humans, wildlife, economy, and environment. Some of the most common spills involve tanker trucks and railroad tankers containing gasoline, chlorine, or other industrial chemicals.

Accidental hazardous waste/materials spills can be reported immediately following the spill, thus reducing the amount of time the spill is left uncontained. Most hazardous waste/materials spills occur with little or no warning, and can be difficult to detect until symptoms present themselves to those affected.[89] External releases may create airborne plumes of chemical, biological, or radiological elements that can affect a wide area and last for hours or days. Internal releases would most likely require evacuation of a facility for hours to days. Both external and internal releases would require extensive clean-up efforts, which could last days to months depending on the type and magnitude of the spill.

While smaller spills may be more frequent in Lee County, larger, more dangerous spills are infrequent.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined Hazard Materials to be a low priority hazard in Lee County. As described in the profile above, Hazardous Material events within the county are infrequent events with an annual probability of less than 0.5. Hazardous Material events have a low range of impact, accounting for less than $50,000 in annual damages. The probable hazard magnitude for Hazardous Materials ranges low to medium, including no deaths or injuries recorded, and a one to two-day warning time before an event. *Table 56* outlines the hazard rankings for each of the hazard priority criteria related to Hazardous Materials.

Table 56: Hazardous Materials Hazard Priority

Probability	Maximum Impact	Probable Hazard Magnitude		Composite Hazard Index
		Death and Injury	Warning Time	
Low Infrequent events with annual probability < 0.5	Low Annual Damages less than $50,000	Low No deaths or injuries recorded	Medium 1 - 2 days	Low

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

A hazardous material release event that takes place at a fixed site can have a great impact on the public that lives around that site. The level of impact from this release can vary greatly depending on the type of waste, the amount of contact an individual has with the chemical, and if there is an explosion or fire associated with the event. Immediate notification to the public is critical after a hazardous material release in order to maintain public safety. A hazardous material release event can be particularly costly to clean up, especially when groundwater and soil have been contaminated. Contamination can travel outward from a spill and leave localities and even regions uninhabitable,

[89] U.S. Air Force, "Protective Actions for a Hazardous Material Release", Http://emc.ornl.gov/CSEPPweb/data/Reports/Misc.%20Reports/HAZMAT.pdf

especially when water and food stocks are impacted. These affected areas also become less attractive to tourists and the economy.

Several facilities in Lee County store, use, dispose, or have the capacity and infrastructure to handle hazardous materials on a regular basis. Some facilities that produce or use hazardous waste report their activities to Lee County. Hazardous materials are widely used at facilities such as hospitals, wastewater treatment plants, and farms. Several household products such as cleaning supplies and paint are also considered hazardous materials and can therefore be found at homes and stores throughout Lee. While smaller spills may be more frequent in Lee County, larger, more dangerous spills are infrequent.

A commodity flow study was conducted for Southwest Florida that began in July 2015. As part of the study, the Interstate 75 corridor was observed in Lee County for a two-hour period. During the observation, eighteen vehicles transporting hazardous materials were recorded. Of the vehicles recorded, four were transporting gasoline, three were an unknown corrosive, two were transporting diesel, and two were transporting a hypochlorite solution[90]. This study highlighted the vulnerability of Lee County to hazardous spills as a result of transport vehicle accidents. Every vehicle carrying hazardous materials is at risk for an accident that could release the materials on board. The vehicles also could be used for malicious activity by their drivers or by hijackers.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Mass Casualty/Mass Fatality

Description

Violent Incidents are primarily considered to be foreign or domestic terrorist attacks, in the form of active shooters and weapons of mass destruction (using biological, chemical, and radiological matter).

Terrorism is defined in the Code of Federal Regulations as "the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." It is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom.

Communities are eligible to receive support from state and federal agencies under the existing Integrated Emergency Management System when a terrorist incident occurs in that jurisdiction. The Department of Homeland Security is the lead federal agency for supporting state and local response to the consequences of terrorist attacks. Terrorism is often categorized as "domestic" or "international." The following descriptions explain the difference:

- Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of the U.S. government or population without foreign direction91.

[90] http://www.swfrpc.org/content/Agendas/2015/12-Dec/LEPC/Item9%20-%20SWFL%20Hazardous%20Materials%20Commodity%20Flow%20Study.pdf

[91] State of Florida Enhanced Hazard Mitigation Plan, August 2013

- International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States or whose activities transcend national boundaries92.

This distinction is based not on where the attack occurred but instead on the origin of the individuals or groups that caused it. For example, the 1995 Oklahoma City bombing was an act of domestic terrorism whereas the September 11, 2001 attacks were international in nature. Ultimately, it's the impact of these attacks on life and property that is the highest priority when it comes to mitigation, preparedness, response and recovery.

An ***active shooter*** is an individual actively engaged in killing or attempting to kill people in a confined and/or populated area.[93] Active shooter incidents can occur in schools, workplaces, places of entertainment, places of worship, and any other location where large groups of people gather. In most cases, active shooters use firearms and there is no pattern or method to their selection of victims. An active shooter can target individual victims in a once-off event or can carry out a ***mass shooting*** in which four or more persons are shot during an event with no cooling-off period between shootings.[94]

Active shooter and workplace/school violence events can last minutes, hours, or days. Depending on the intent of the perpetrator, damages can be limited or extensive and can involve small firearms or large "stand-off" weapons (for example rocket propelled grenades).[95] In most cases in the United States, armed attacks involve small firearms and are typically of short duration (i.e. less than a few hours). Aggressors may target a specific person or group of people; they may also seek to make a political or social statement.

Weapons of mass destruction (WMD) are defined as (1) any destructive device as defined in 18 U.S.C., Section 2332a, which includes any explosive, incendiary, or poison gas, bomb, grenade, rocket having a propellant charge of more than four ounces, missile having an explosive or incendiary charge of more than one quarter ounce, mine or device similar to the above; (2) poison gas; (3) any weapon involving a disease organism; or (4) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life.[96]

Although bombs are still the weapon of choice for most terrorists, many are beginning to use nuclear, biological, and chemical weapons for their terrorist acts. The ways they spread these contaminants vary by the type used. For an attack on a wider area, terrorists may use crop dusting techniques or introduce the agent into the heat and air conditioning system of a building. The terrorist's goal is to reach the maximum number of people with the minimum amount of nuclear, biological, or chemical material.[97]

Location and Extent

While it is difficult to predict the exact locations and targets for a terrorist attack, there are certain factors used to select potential targets:

- Produce a large number of victims and mass panic

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[92] Ibid.

[93] U.S. Department of Homeland Security.

[94] FBI

[95] Reference Manual to Mitigate Potential Terrorist Attacks against Buildings. FEMA Publication 426. December 2003

[96] Ibid.

[97] Ibid.

- Attack places that have a symbolic value
- Get the greatest possible media attention

Terrorists also select targets best suited for the type of material being used. For example, some biological agents are not effective in sunlight. Most chemical agents are more effective indoors with limited airflow. A radioactive material will be most effective where large numbers of people will pass by without detecting it. Terrorists are likely to target heavily populated, enclosed areas like stadiums, government buildings, sporting events, airport terminals, subways, shopping malls, and industrial manufacturing facilities.[98]

Lee County, and much of the rest of Florida, is considered to be vulnerable to violent incidents, especially terrorism, because of the prevalence of tourist attractions such as beaches, sports complexes, and museums. Mass Casualty incidents that are larger in scale would impact hundreds of individuals, cause major loss of life and require significant response resources.

Previous Occurrences

Table 57 shows the recent history of violent incidents in Lee County. *Table 58* shows some of the larger events within Florida since 2011.

Table 57: Violent Incidents in Lee County, Florida

Date	Location	Incident Type	Information
November 2006	Sanibel	Bomb	In Sanibel, Florida, a small bomb was found in a parking lot located among three restaurants. Authorities said the eight inch by two inch by three-inch bomb was connected to a cell phone. It was rigged so that if the phone was called, the device would explode. The Lee County bomb squad responded to the scene and dismantled the device. Two other restaurants and a nearby road were closed for about four hours.[99]
April 14, 2009	Sanibel	Bomb	A suspicious item that discovered on the beach in Sanibel was later determined to be a bomb device. The Lee County Authority Bomb Square arrived at the scene and assumed incident command. The device was detonated by bomb unit personnel.[100]
June 5, 2016	Cape Coral	Active Shooter	A gunman went on a shooting spree in Cape Coral, killing three people and injuring three others. The gunman opened fire at two separate location including a store.[101]
July 25, 2016	Fort Myers	Active Shooter	Two teenagers were killed and at least 18 people were wounded on July 25, 2016 when multiple gunman opened fire outside a nightclub, Club Blu, in Fort Myers, FL. The attack was not considered an act of terror. [102]

[98] Reference Manual to Mitigate Potential Terrorist Attacks against Buildings. FEMA Publication 426. December 2003

[99] Ibid.

[100] http://www.northfortmyersneighbor.com/page/content.detail/id/501173/Bomb-unit-detonates-device-discovered-on-beach.html?nav=5174

[101] http://www.abc-7.com/story/32149535/3-killed-including-gunman-in-cape-coral-shooting-spree

[102] http://www.nytimes.com/2016/07/26/us/fort-myers-club-blu-shooting.html?_r=0

Table 58: Major Terrorism Events in Florida since September 11, 2001

Date	Event Description
December 2001	Richard Reid unsuccessfully attempted to blow up an American Airlines Paris-to-Miami flight by placing explosives in his shoes.[103]
April 2007	Six schools in six different Central Florida counties received bomb threats over a seven-day period. One threat forced authorities to evacuate East Ridge High School in Lake County and another anonymous note threatened to detonate a bomb at West Port Middle and High School in Marion County. A similar bomb threat occurred that same day at Jones High School in Orlando. Two similar bomb threats occurred at Merritt Island High in Brevard County, followed by the arrests of two teenagers in connection with the bomb threats.[104]
May 2010	The Federal Bureau of Investigation (FBI) investigated a pipe bomb found at the scene of the May 10, 2010 attack at the Islamic Center of Northeast Florida (ICNEF) in Jacksonville, Florida. There were 60 people in the building at the time of the attack.[105]
May 2011	The FBI arrested three Pakistani-Americans, including father and son imams from South Florida mosques, charging them with providing financing and other material support to the Pakistani Taliban.[106]
January 2012	Sami Osmakac, an American citizen born in the former Yugoslavia who is a Florida resident, was charged with plotting a terrorist spree around Tampa, including bombing nightclubs, destroying bridges, and shooting police officers in the name of radical Islam.[107]
June 12, 2016	A gunman named Omar Mateen opened fire at a gay nightclub in Orlando, Florida, killing forty-nine people and injuring at least fifty others. The gunman was killed in a shootout with officers.[108]
January 6, 2017	Esteban Santiaago, a U.S. citizen and former member of the National Guard that served in Iraq, opened fire in a baggage claim area of the Fort Lauderdale-Hollywood International Airport. Five people were killed and eight were injured in the attack. The shooter claimed to have carried out the attack on behalf of ISIS, an FBI agent testified. ISIS has not claimed responsibility for this attack.[109]

Probability of Future Events

The open availability of basic shelf-type chemicals and mail-order biological research materials, coupled with access to even the crudest laboratory facilities, could enable the individual extremist or an organized terrorist faction to manufacture proven highly lethal substances or to fashion less sophisticated weapons of mass destruction (WMD). The use of such weapons could result in mass casualties and long-term contamination and could wreak havoc to both the state and national economies[110].

[103] State of Florida Enhanced Hazard Mitigation Plan, August 2013.

[104] State of Florida Enhanced Hazard Mitigation Plan, August 2013.

[105] http://www.realcourage.org/2010/05/florida-fbi-investigation/

[106] http://www.nytimes.com/2011/05/15/world/15taliban.html/

[107] http://www.nytimes.com/2012/01/10/us/florida-man-charged-with-plotting-strikes-in-name-of-islam.html?_r=1

[108] https://www.nytimes.com/interactive/2016/06/12/us/what-happened-at-the-orlando-nightclub-shooting.html?rref=collection%2Fnewseventcollection%2F2016-orlando-shooting

[109] http://www.cnn.com/2017/01/17/us/fort-lauderdale-shooter-isis-claim/

[110] State of Florida Enhanced Hazard Mitigation Plan, August 2013.

Unlike natural disasters, there are relatively few methods to predict the time or place of a WMD/terrorist event. This fact negates the "watch" and "warning" time phases. As outlined in the State of Florida Enhanced Hazard Mitigation Plan, the action phases for a WMD/terrorist event will be Prevention, Protection, Mitigation, Response, and Recovery. Activities associated with each action are detailed below:

Prevention Phase

- The actions during this phase are those taken by local, state, and federal agencies to monitor and coordinate intelligence and other potential indicators to prevent, defend against, prepare for, and mitigate the impacts of terrorist attacks against our nation.
- The state uses intelligence provided by Fusion Centers, Joint Terrorism Taskforces, and Regional Domestic Security Taskforces.

Protection Phase

- The actions during this phase are those taken by local, state, and federal agencies to limit the impacts of a potential event on a specific area.
- These actions could occur during the threat of a natural event such as a hurricane, or during a terrorist threat.

Mitigation Phase

- The actions during this phase are those that require time to carry out. They include mitigation, training, planning, public awareness, and any activities that require long-term programs to accomplish their objectives.
- These pre-disaster activities take place in the normal living and working environments of the participants.

Response Phase

- The actions during this phase are those emergency response activities taken during the first 72 hours to a few weeks after the incident.
- These actions are those taken immediately after an incident with the major goal of saving lives, alleviating suffering, and preventing further disaster.
- When responding to disaster events, the National Incident Management System (NIMS) will be used by trained/qualified staff to manage the response actions.

Recovery Phase

- The actions during this phase are those taken during the first one to two months after the incident.
- These actions, which begin immediately after the emergency response operations, have the goal of returning the state and citizens to normal conditions.
- The emphasis will transition from saving lives to cleanup of the affected areas and returning people to normal activities.

Vulnerability and Risk Assessment

Hazard Ranking

The priority hazard ranking process for the 2017 HIRA determined violent incidents to be a low priority hazard in Lee County. As described in the profile above, violent incident events within the county are infrequent events with an annual probability of less than 0.5. Violent incident events have a low range of impact, accounting for less than $50,000 in annual damages. The probable hazard magnitude for violent incidents is high, including deaths and injuries reported, and less than a 24-hour warning time before the event. *Table 59* outlines the hazard rankings for each of the hazard priority criteria related to violent incidents.

Table 59: Violent Incidents Hazard Priority

Probability	Maximum Impact	Probable Hazard Magnitude: Death and Injury	Probable Hazard Magnitude: Warning Time	Composite Hazard Index
Low Infrequent events with annual probability < 0.5	Low Annual Damages less than $50,000	High Death and injury reported	High Less than 24 hours	Low

Vulnerability, Risk, and Impact to People, Property, the Environment, and Operations

While any location in Lee County is at risk of experiencing a mass casualty event, Cape Coral and Fort Myers are population dense areas of the county that could potentially be more likely targets for a mass casualty event, especially one caused by terrorism. Any areas surrounding a mass casualty event will be in danger of additional injuries and fatalities depending on the type of attack. A mass casualty event can be particularly chaotic for first responders who can become quickly overwhelmed by responding simultaneously to the crisis and consequences of an attack. In the event of a terrorist attack, response could become inhibited due to debris on the road, traffic, or airborne disease/chemicals. Access must be coordinated in order to perform effective rescue efforts. First responders may also be targeted in the event of secondary attacks.

In the event of a biological terrorism attack, the diseases or biological agents released could damage plants and infect animals. A radiological dispersion device or an improvised nuclear device could have a long-term impact on the environment and human health. Radiological or nuclear attacks also have the potential to be very costly to remediate. Damage to infrastructure and property from radiological or nuclear attacks, or explosive devices, also can be costly to repair and rebuild.

See the Consequence Analysis at the end of this section for a more detailed look at this hazard's vulnerability, risk, and impact to people, property, the environment, and operations.

Consequence Analysis

The following consequence analysis analyzes the impact of the hazards identified in the HIRA on:

1) The public;
2) Responders;
3) Continuity of operations including continued delivery of services;
4) Property, facilities, and infrastructure;
5) The environment;
6) The economic condition of the jurisdiction and
7) Public confidence in the jurisdiction's governance.

Table 60: Consequence Analysis

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Animal/Plant Disease Outbreak	Animal and plant disease outbreaks have the potential to have significant consequences for the general public. Depending on the type of animal borne disease, it could be spread to the general public and cause illness and even death. Individuals can become infected by diseases such as rabies or Lyme disease, which can have serious consequences for human health. Contamination of food and water supplies by animal diseases could be disruptive to the normal public routine.	Responders to animal disease outbreaks are typically highly trained professionals. These outbreaks can be highly contagious and have the potential to cause a number of illnesses and deaths in the response and support personnel, thus limiting the capacity to handle the response.	COOP plans ensure that state and local agencies are able to continue performance of essential functions in the wake of an animal or plant disease outbreak.	In response to a severe animal disease outbreak, roads and various transit services may be closed or with altered service in order to protect public safety. These transportation changes could affect the delivery of goods and services, especially increasing delivery time. The magnitude of this effect could be at a local, state, or even nationwide level, depending on the severity of the outbreak.	The impact of animal and plant disease outbreaks on property and infrastructure will be minor due to the nature of the hazard. However, occupants of these properties and facilities may need to take precautions to prevent exposure to these diseases.	Animal and plant disease outbreaks will have the greatest impacts on the environment of an area. Plant diseases could kill off large quantities of a specific species or several species of plants. Animal diseases could cause illness and even death. There is also a risk that animal diseases could spread to humans.	There is a high potential for an animal or plant disease outbreak to cause significant economic damage to the County, especially in agriculture, specifically the citrus industry. Lee County has over 800 farms that contribute to a market value of agricultural products sold totaling over $100 million. Lee County also raises more than 14,000 head of cattle.	Animal disease outbreaks will instill fear among consumers and bring into question the safety of meat and food products generated in Lee County.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Coastal Erosion	Coastal erosion may impact homeowners and tourists located along the coast. Over time, coastal erosion can reduce the size of public and private beaches. Sometimes coastal erosion can accompany other hazards such as hurricanes or tropical storms. Coastal erosion may create unsafe swimming conditions for the public.	Beach lifeguards are responsible for the protection of the public and enforcing the necessary beach closures that are associated with coastal erosion, especially as a result of a coastal storm.	COOP plans ensure that state and local agencies are able to continue performance of essential functions in the wake of a coastal erosion event.	Road and bridge closures can result from coastal erosion events in order to protect public safety. When these kinds of closures occur, the ability to deliver goods and services efficiently will be impacted locally, regionally, and even statewide depending on the magnitude and severity of the event.	As shorelines become more eroded, property and infrastructure will be at increasing risk of flooding. In a 2000 report to the United States Congress, FEMA estimated that coastal erosion may cost property owners $500 million a year in structural damages and loss of land. Erosion events that impact development or infrastructure may cause the release of hazardous substances into the environment such as heating fuel and sewage.	Coastal erosion is the removal of beach and dune sediments primarily due to wave action and tides. This process negatively impacts beaches, wetlands, marshes, and coastal habitats. As these coastal habitats are eroded, coastal communities may experience more frequent and destructive flooding, compromised water supplies, and smaller or fewer beaches.	The coastline is an important part of Lee County's economy including several public beaches. Beach renourishment programs can be used to replace lost sediment due to coastal erosion however these programs can be costly and will not ultimately stop future erosion from occurring.	Governmental response, on all levels, requires direct actions that must be immediate and effective to maintain public confidence.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Drought/ Extreme Heat	The effects of drought and extreme heat can have severe consequences on the well-being of those more vulnerable to severe conditions, such as the elderly and young children. Prolonged periods of drought can diminish public water supply, leading local utilities to impose water use restrictions. Loss of electricity may impact air conditioning and cooling mechanisms in homes, leading to increased indoor temperatures. Public Health Impacts: Physical effects of heat can cause major health problems, dehydration, and may lead to death. People begin to suffer heat-related illness when their bodies are unable to compensate and properly cool. Heat stroke may increase the body temperature to 106 degrees Fahrenheit or higher. Very high body temperatures may damage the brain or other vital organs.	Without proper mitigation efforts to heat, drinking water and proper rest, responders can become hampered in their efforts from extreme heat. Emergency responders will be susceptible to heat stroke and severe dehydration as a result of extreme heat waves. Extreme heat may also damage instruments or equipment necessary for response activities.	Lee County Emergency Management Agency maintains a COOP plan. In the event of extreme heat, the agency will utilize the plan.	The urban areas of Lee County are most likely to experience the hottest temperatures. Extreme heat waves can impact the efficiency of the delivery of goods or services. This results in a cascading effect related to workers being negatively affected by the extreme heat, which in turn drives productivity down significantly. Equipment and vehicles may be damaged due to high temperatures and sun exposure. Extreme heat may also damage goods if exposed to high temperatures for longer periods of time.	With the urban areas of Lee County most likely to experience extreme heat, the infrastructure and property here is considered most vulnerable to this risk. Water treatment plans and reservoirs are directly impacted by periods of drought. Operational efficiency will be impacted and water scarcity will become an issue. Facility integrity is at risk with regards to power cables and stations becoming overheated. This overheating could lead to brownouts in urban areas, especially if power lines are damaged by the heat and air conditioning systems become inoperable. Extreme heat may also lead to spontaneous fires, which can further complicate response operations, as well as soften asphalt and damage highways and roadways.	Droughts often coincide with extreme heat events. Extreme heat can cause significant damage to the local environment by dehydrating vegetation and wildlife, which could create a cascading effect to the surrounding environment. Drought and extreme temperatures may severely decrease the yield of Lee County's citrus industry. Livestock are also adversely affected by drought and extreme heat and may suffer medical problems or death.	Drought and extreme heat drains state, and local resources. Under the most severe drought and heat conditions, some of the costs can be recouped through federal grant reimbursements, but there is a fiscal impact on the local government.	Governmental response, on all levels, requires direct actions that must be immediate and effective to maintain public confidence.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Epidemic/Pandemic Diseases	Epidemic and pandemic diseases will have far ranging impacts on the citizens of Lee County, especially through mortality and morbidity of the disease. There will also be psychosocial impacts on the population as a result of widespread infection.	First responders with direct patient contact will be at greater risk of infection from epidemic and pandemic diseases. As more healthcare providers become infected, this could impact greater impact the healthcare facilities' staffing and logistics.	COOP plans ensure that state and local agencies are able to continue performance of essential functions in the wake of an epidemic or pandemic.	Road and bridge closures, as well as other transit service disruptions, may occur in order to protect public safety in the event of an epidemic or pandemic. If closures occur, the ability to deliver goods and services efficiently will be impacted locally, regionally, or statewide depending on the magnitude or severity of the event. Measures put in place to limit the exposure of the public to disease could disrupt gatherings and delivery of goods, especially food.	An epidemic or pandemic is not anticipated to impact property or infrastructure directly. Indirect impacts could include increased worker absences from facilities that leads to decreased maintenance and compromises safety or integrity of facilities or plants. Increased absences could also contribute to the loss of basic services such as garbage collection and routine maintenance repairs. Healthcare facilities are the exception: a loss of staff due to absences would directly affect that facility's ability to operate and impact the quality of patient care.	Depending on the severity and type of epidemic and or pandemic disease, there could be considerable impacts on the environment. Diseases that are transmitted from animals to humans or humans to animals may impact agriculture.	The impact of an epidemic or pandemic disease on Lee County's economy would greater depend on the mortality and morbidity rates. The greater the mortality and morbidity rates, the larger the impact on the county's economy. The ability for the area to acquire and sell goods and services would diminish as a result. Over time, as the disease spread, economic effects would compound and potentially cause a breakdown of society at its most basic level.	An epidemic or pandemic has the potential to impact the public's confidence in Lee County's governance. Governmental response, on all levels, requires direct actions that must be immediate and effective to maintain public confidence.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Flood	Flooding directly impacts members of the public in a low-lying area or floodplain, typically near the coastline, a river, or a lake. Significant flooding events can lead to the damage and loss of homes, property, and businesses, which can impact public morale and safety. Flash flooding and excessive rainfall may lead to dangerous conditions on roadways, as well as create mudslides that may damage property. Public Health Impacts: Closures of primary-care physician offices is a major public health concern if flooding causes the buildings to be uninhabitable. Water sources may also become contaminated with toxic material or human waste, and water or sewer systems may be completely disrupted. Vector-associated problems can increase the risk for some mosquito- borne infectious diseases.	Coordinating response to flooding events can be a significant effort by first responders. Fire, police, and emergency responders are often called on to evacuate people from a flood area if flooding is imminent, as well as close roads, pump out flooded basements, attend to the injured, and direct traffic away from the flooded area and roads. First responders may face challenges with transportation and access to a location due to flooded or obstructed roadways. Flash floods due to heavy rainfall can also injure first responders, as well as delay response operations.	Lee County Emergency Management Agency maintains a COOP plan. In the event of flooding, the agency will utilize the plan.	Flooding has the propensity to cause road and bridge closures, as well as disrupt transit service. If any of these shutdowns occur, the ability to deliver goods and services efficiently will be impacted. Exposure to water may also damage or destroy physical goods such as food, clothing, and hygiene products.	Flooding can cause significant property destruction, including water damage to houses and businesses. This in turn impacts the market value of flooded property. In addition, floods can impact schools, hospitals, and other public infrastructure which impacts the public's ability to use these services. Road infrastructure can be impaired or compromised based on the size and scale of flooding, which can also disrupt transportation infrastructure. Water sources can become contaminated with toxic chemicals, dangerous chemicals, or fecal matter. Because water and sewer systems may be disrupted, solid-waste collection and disposal may also be impacted, causing dangerous public health risks.	Rising waters from flooding impact the environment by spreading pollution, inundating water and wastewater treatment plants, carrying debris, and disrupting wildlife and reserve areas. In addition, the standing water following a flooding event can facilitate the spread of vector-associated issues such as mosquitos, disease, and other public health risks.	Significant and repeated flooding can lower property value throughout the county, which can have a deleterious effect on the tax base. Furthermore, flooding drains response resources, which can be costly during a large flooding event for disaster reimbursement.	Ineffective flooding response can decrease the public's confidence in the county's ability to respond and govern. Multi-level government response requires direct actions that must be immediate and effective to maintain public confidence. Efficiency in response and recovery operations is critical in keeping public confidence high.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Freeze/ Extreme Cold	Lee County residents are particularly susceptible to the dangers of extreme cold and freeze events due to the common lack of heating systems in home. Pipes in homes may freeze and burst, causing disruption of water service, as well as flooding. Extreme cold and freeze events that are coupled with icing can also cause power failures, communication disruption, and dangerous driving conditions. The use of space heaters and fireplaces to sustain warmth increases the risk of household fires and carbon monoxide poisoning. Animals can also be heavily affected, especially if kept outdoors or without shelter. Public Health Impacts: Homes can quickly decrease in temperature, especially due to a power outage, and individuals without shelter who face	While extreme cold events are very infrequent in Lee County, the risk still remains to first responders. First responders may face icy and dangerous road conditions, as well as risk personal injury due to working in an extremely cold environment. Ice on roads may lead to vehicular crashes and prolonged response times. First responders will also respond to more cold-related injuries such as hypothermia.	Lee County Emergency Management Agency maintains a COOP plan and in the event of extreme cold, will utilize the plan appropriately to the situation.	Extremely cold temperatures may damage or destroy goods if exposed for longer periods of time. The citrus crop is particularly susceptible to extreme cold and freeze events, resulting in economic losses and plant damage. Delivery of services may be impacted by icy and dangerous transportation conditions, causing food, water, and resource systems to be delayed or halted, as well as personal transportation by the public. Waterways can freeze, stopping barge and ship traffic.	The cascading effects of extreme cold can bring critical infrastructure to a halt. Critical facilities may be shut down or disrupted due to unsafe travel conditions for workers, the risk of serious health problems, or the failure of processes, materials, and machinery. Energy consumption is extremely high during extremely cold conditions due to heating homes, which creates a strain on energy supply. Communities may also face ground freezing problems, which affects the water supply, sanitation, and agriculture.	Extreme cold can freeze crops and food sources, as well as disrupt ecosystems. Citrus crops are particularly at risk to freeze events and when exposed can damage the fruit produced. Pipe ways and critical facility equipment may freeze and break, causing hazardous and dangerous chemicals and materials to spread into human and animal-populated areas, as well as water systems and the food supply. Extremely cold temperatures may injure or kill wildlife.	Local and state agencies, as well as businesses and general commerce, may face a sharp decline in revenue as individuals stay home due to being unable to get to work. Resources from all levels will be utilized and the local government will face fiscal consequences. Energy consumption greatly increases during extremely cold weather due to the increased heating of homes, businesses, and critical facilities for prolonged periods of time. The increase in generating heat energy comes at a high cost for local and state agencies, as well as homeowners.	Extreme cold is a very dangerous threat that can adversely affect the public, first responders, infrastructure, agriculture, economy, and overall county operations. Direct, effective, and timely response by all levels of government is required for public confidence in the state's governance.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
	prolonged exposure may face cold-related health problems such as frostbite, hypothermia and death. Infants and older adults are particularly at risk.							

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Storm Surge Flooding	Lee County is a vacation and tourist destination. The overlap between hurricane and tourist seasons can seriously impact both tourist populations and residents of coastal areas. Immediate damage to homes, businesses, infrastructure, government facilities, and roadways causes major disruptions in response operations for the entire county, which heavily impacts the public. Longer-term impacts can include population loss and economic destruction. Severe storm surge may injure the public or cause death. Public Health Impacts: Extreme flooding and storm surge may cause death or injury for humans and animals. Hazardous waste and material may be introduced into flooding waters, contaminating water supplies as well as standing water. Toxic materials, carcasses, and	Coordinating an evacuation in advance of a significant hurricane or tropical storm event requires enhanced response coordination and causes a substantial strain on resources. First responders also face the hazards flooding, high winds, and storm surge bring, which may lead to personal injury, disease, or death. Critical roadways and response facilities may flood, lose power, or become damaged or destroyed. Response equipment and vehicles may become inoperable or inaccessible, further complicating response and recovery operations.	Lee County Emergency Management maintains a COOP plan. In the event of a hurricane or tropical storm, the county will utilize the plan. COOP plans ensure that local agencies are able to continue performance of essential functions in the wake of a hurricane or tropical storm. Should flooding impact a government building or agency, continuity of operations could be impacted and the agency would need to relocate to their alternate facility as outlined in the COOP plan.	Similar to the impacts of flooding, hurricanes and tropical storms can cause road and bridge closures and transit disruptions to ensure public safety in the wake of the storm. In addition, many businesses in the hurricane evacuation zone shut down to prepare safely for the storm. As such, the ability to deliver goods and services efficiently will be impacted depending on the magnitude of the storm. Goods and delivery vehicles may become damaged, destroyed, or inoperable under the current conditions.	Hurricanes and tropical storms, depending on the magnitude and impact, can cause widespread destruction to property, facilities, and infrastructure. Residential and commercial properties that are damaged or destroyed by a coastal event can face significant recovery efforts. In addition, hurricanes and tropical storms can impact roads, bridges, schools, and hospitals in the evacuation zone through water damage from storm surge, as well as drifting sand from storm winds. Large coastal storms can also cause power outages and disrupt transportation and communications infrastructure, such as roads, bridges, telecommunications towers, and Internet connectivity.	The storm surge associated with hurricanes and tropical storms can cause extensive beach erosion that negatively impact the environment in the long and short term. Changes in habitat and food availability due to flooding and storm surge can heavily impact the health of animals, as well as cause death.	Lee County has a significant tourist industry that furnishes the state economy. A major hurricane or tropical storm could cause damage to beaches, historicalal sites, and other areas that tourist frequent. In addition, the costs associated with response and recovery, although reimbursable during a federal declaration, are significant and can have cascading impacts on the state economy at large.	Immediate, effective, and direct actions are necessary to build and foster public confidence in county governance. Efficiency in response and recovery operations is critical in keeping public confidence high.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
	waste can lead to the spread of disease. Disease vectors such as mosquitos may increasingly spread due to standing water, and may infect humans as well as other animals.							

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Sustained Wind (Tropical Storm)	High sustained winds due to a tropical storm or hurricane can lead to damage of private and public property, vehicles, food sources, trees, and powerlines, as well as cause bodily injury from flying debris. Power outages can lead to disruption of employment, businesses, commerce, communication, and food resources. Hurricane force winds may also cause buildings and structures to collapse, which may cause injury or death. Public Health Impacts: The damage of tropical and hurricane force winds may cause chemical and hazardous materials to spread to sources of food, water, and areas utilized by the public as well as animals.	The ability of first responders to conduct their duties may be hindered by high sustained winds, especially if trees, powerlines, and/or debris have impacted roadways and transit. High winds may also destroy property and resources of first responders. High winds may create power outages that can hinder critical communications, access, or usability of resources. Injuries to first responders and equipment may be caused by flying debris, further challenging response operations.	Lee County Emergency Management maintains a COOP plan. In the event of high winds, the agency will utilize the plan.	The delivery of goods and services will be impacted locally, regionally, or statewide if hurricane force winds cause powerlines, debris, and woody debris to fall into roadways or other structures, obstructing passage and access. Excessive winds can also damage suspension bridges, as well as cause damage to transport vehicles, loading docks, and goods being transported. In addition, many businesses in the hurricane evacuation zone shut down to prepare safely for the storm.	The winds associated with a tropical storm or hurricane can cause minor to extreme damage to property, ranging from peeling off surfaces and roofs, to total destruction of foundations and steel-reinforced concrete structures. Excessive winds can uproot and topple trees, lift cars, break windows, and knock out powerlines, leading to power outages to critical facilities. Transportation pathways may become obstructed by hazardous and non-hazardous debris, slowing down response and recovery activities. Water systems and reservoirs may become full of debris, leading to an impact on the water supply system. The ability to disrupt the power supply causes a cascading effect in other critical infrastructure, where electricity utilization is critical.	The impact of high winds on the environment affects foliage, trees, animals, cars, and structures, leading to the chance of hazardous and dangerous chemicals and materials being introduced into local waterways, agriculture, public and private spaces, and can affect fragile ecosystems. The power of high winds has also been harnessed for renewable energy, where wind turbines rotate with the force of the wind, creating electricity.	Lee County has a significant tourist industry that furnishes the state economy. A major hurricane or tropical storm could cause damage to beaches, historical sites, and other areas that tourist frequent. In addition, the costs associated with response and recovery, although reimbursable during a federal declaration, are significant and can have cascading impacts on the state economy at large. While federal grant reimbursements help cover the costs of damage, there is still a fiscal impact on the local government.	Ineffective response both before and after a hurricane or tropical storm can decrease the public's confidence in the state's ability to respond and govern. Governmental response across local, state, regional, and federal levels requires direct actions that must be immediate and effective to maintain public confidence.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Thunderstorm Winds/Lightning/Hail	Thunderstorms can have high winds, rain, hail, flooding, and excessive lightning, all of which can cause heavy damage, destruction, and injury to the public. Thunderstorms can cause destruction of property, power failures, hazardous materials spills, and even injury or death. Additionally, thunderstorms present some risk to those who are exposed to the elements during such events. Those most at-risk are low-income and homeless individuals without proper shelter from the elements during major thunderstorms. Public Health Impacts: Potential health concerns include lightning fatalities and long-term physical and mental effects for survivors.	Thunderstorms can prevent first responders from accessing roadways due to flooding, trees, or debris. Exposure to lightning, flooding, and high winds may also cause injuries to first responders. Vehicles and resources may be damaged, leading to impaired response activities. Extreme caution may need to be exercised if thunderstorms produce major rains or hail, and if visibility is decreased.	Lee County Emergency Management Agency maintains a COOP plan and in the event of thunderstorms, will enact the plan appropriately to the situation. To date, there have been few or no major incidents that have shut down state, county, or municipal governmental operations.	Delivery of services may be impaired by flooding, obstruction, and destruction of roadways and resources. The ability to deliver goods and services will be impacted locally, regionally, or statewide depending on the magnitude of the event. Goods, equipment, and vehicles may become damaged during transport due to the various elements of a thunderstorm.	Power lines and power generators are most at risk from thunderstorms and their by-products. A strike of lightning to a power line could create a cascading affect for isolated power outages or full-scale blackouts depending on the severity of the weather. Building and vehicle damage can occur from hail and airborne debris. Properties and critical facilities also may face foundational and physical damage due to flooding, lightning strike, or excessive winds, delaying response and recovery operations. Power outages and physical damage to structures may cause energy supply and water supply systems to be disrupted or fail. Sewerage systems may be compromised and taken off grid.	Flooding and excessive winds may cause foundational and structural damage, leading to the risk of the spread of hazardous waste among populated areas, water ways, and food sources. Waste and debris from structure damage can contaminate sources of water, food, and safety. In addition, debris and by-products of thunderstorms can impact the environment by: possibly spreading debris and pollution; damaging sewer and wastewater treatment plants; and disturbing the wildlife and natural areas. Lightning strikes may also ignite wooded areas or fields, leading to destruction of agricultural crops, critical ecosystems, and natural habitats.	Flooding, high winds, lightning, and hail can drain state and local resources. By-products of thunderstorms can drain state and local resources. Even if some of the costs can be recouped through federal grant reimbursements (should the event warrant a federal disaster declaration), there is a fiscal impact on the local government.	Ineffective thunderstorm response can decrease the public's confidence in the state's ability to respond and govern. Governmental response across local, state, regional, and federal levels requires direct actions that must be immediate and effective to maintain public confidence.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Tornado	Tornados typically effect a small but concentrated area. Tornados that touch down can cause extensive damage to infrastructure and be very disruptive to the lives of those impacted. In addition, tornados can cause power failures, hazardous materials spills, and even injury or death.	Fire and police, and emergency responders are called on to evacuate people from the impacted area, close roads, attend to the injured, and direct traffic away from the disaster area. Tornados can make response in the aftermath of a tornado quite challenging due to downed trees and debris blocking roadways.	COOP plans ensure that state and local agencies are able to continue performance of essential functions in the wake of a tornado.	Road and bridge closures, as well as transportation service disruptions, may occur as a result of downed trees and debris on the roadway after a tornado. The ability to deliver goods and services will be impacted locally and regionally depending on the magnitude of the tornado. Goods, equipment, and vehicles may become damaged during transport from the high winds and airborne debris during a tornado.	Tornados have the potential to cause significant property damage to property, facilities, and infrastructure along the path of touch down. The high winds associated with a tornado can pull roofs off of homes and blow out windows. Strong tornados can cause large objects to become airborne causing significant structural damage. Mobile home parks are particularly susceptible to experiencing destruction during a tornado.	Tornados have the potential to impact the environment by spreading debris and pollution and disturbing wildlife and natural areas.	Tornados can drain local and county resources due to the high damage potential of these events. Even if some of the costs can be recouped through federal grant reimbursements, there is a fiscal impact on the local government.	Governmental response, on all levels – state, county and local, requires direct actions that must be immediate and effective to maintain public confidence.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Wildfire	The effect of fire can extend beyond the initial impact caused by fire damage. Deaths from fires and burns are the fifth most common cause of unintentional injury deaths in the United States. People located in the immediate area of the fire face the risk of relocation for unknown periods of time, especially due to complete destruction of a certain area. Since 2003, major changes have occurred in fire prevention and management in public venues, decreasing the risk to the public of a major fire. Public Health Impacts: Fire, whether urban or wildfire, can release toxic components which can cause adverse health effects in people as well as animals. The respiratory and cardiovascular systems are most affected by fire and smoke inhalation, and psychological and psychiatric problems may arise as well due to	Fire, police, and emergency responders are called on to evacuate people from the fire area, close roads, create fire breaks, attend to the injured, and direct traffic away from the area. First responders may also have to deal with the psychological reactions of the public during an extreme event, such as trauma and shock. Firefighters are at a higher risk of smoke inhalation, burns, and health problems due to working in close proximity to fires and the subsequent smoke.	COOP plans are a requirement of the state and local governments. COOP plans provide the framework to ensure that state and local agencies are able to continue performance of essential functions under a broad range of circumstances such as large fire events.	Fires can cause disruption of services in the event of a wildfire in the impacted area. If a fire does occur, the ability to deliver goods and services efficiently could be impacted locally, regionally, or statewide depending on the magnitude of the event and level of service disruptions. Normal operations would be affected and could lead to a drop in level of services or inability to provide certain services. Goods and facilities may also be damaged or destroyed by fire, smoke, or extremely high temperatures. There may also be an increased demand on health services due to the challenge of access to healthcare facilities by patients with chronic healthcare conditions.	Fire can damage or completely destroy property and critical facilities, as well as lead to interruption of the power supply system. A fire of significant strength can cause major damage to buildings or farmland. Large fires may also interrupt transportation systems such as train and bus lines, creating a challenge for public transit, especially during evacuation.	Fires can cause significant impact to the environment by: spreading pollution; creating health problems; carrying ash and smoke; damaging agricultural crops; and disturbing the wildlife and natural areas. Water and soil pollution caused by fire can cause longer term threats to human and ecosystem health. Fire damage may also affect soil formation, nutrient cycling, and carbon sequestration and storage. An important component of recovery also includes restoring sensitive habitats and environments that were damaged.	Fires drain state and local resources. There is a fiscal impact on the local government even if costs can be recouped by federal grants. Lee County's agriculture and tourism are a major component of the economy. Major fires can cause significant impact to those sectors, further draining county resources. Costs may be associated with loss of income from the land following incidents, the cost of damage to property, firefighting, and restoring sensitive habitats and environments.	Governmental response, on all levels – state and local – requires direct actions that must be immediate and effective to maintain public confidence.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
	exposure to the traumatic event. Young children and the elderly are especially vulnerable to health and medical issues stemming from fire and smoke exposure.							

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Aircraft Crash	Depending on the severity of an aircraft crash, it can result in injury and death of passengers. Mass casualty of passengers will impact their families, friends, and communities.	Response time could be impacted if the aircraft crash has caused damage to roads or bridges that has resulted in closures. The crash of a large passenger		Road and bridge closures, as well as transportation service disruptions, may occur as a result of an aircraft crash in order to protect public safety. The ability to deliver goods and services will be impacted locally and regionally depending on the extent of closures.	Property, facilities and infrastructure can sustain damage if impacted by an aircraft crash. Depending on the severity of the impact, repair of damages could be costly.	An aircraft crash can result in a fuel spill that can contaminate an area with hazardous material. Jet engine fuel can have a negative effect on natural environments, especially if it enters a waterway where the contamination can spread very quickly. Aquatic animals and plants will be directly impacted by this kind of water contamination.	The county's economy will not experience a large impact as a result of an aircraft crash since this is a localized event. If damages occurred on county property, some costs would be incurred to repair damages.	The public's confidence in county governance will depend entirely on the initial response to an aircraft crash. A well planned response to an event can lead to a successful mitigation and the establishment of public confidence in the government's ability to respond.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Cyberattack	The public is heavily reliant on technology for daily life, including cell phones, handheld devices such as tablets, and computers. Any disruption to this technology caused by a cyberattack could impair the ability for the public to conduct basic activities, such as communications and mobile banking. Public Health Impacts: Although mostly indirect, public health impacts of cybersecurity incidents may include loss of access of important medical information and services, personal information, and unwanted sharing or dissemination of that information to other parties. Disruption in attaining medical help or resources may delay receiving proper medical attention or care.	Cyberattacks can interfere with emergency response communication and activities. Given that many first responders rely on technology both at operations center and in the field, a cyberattack could impair the ability to communicate. For example, many agencies rely on technology to notify and route responders to the scene of the emergency. More specifically, 911 dispatch centers rely on technology which makes them vulnerable to cyber exploits. In addition, the nebulous nature of a cyberattack makes coordinated response convoluted and complicated.	A cyberattack could cause significant communications or energy-based disruptions. Specifically, agencies that rely on electronic backup of critical files are vulnerable to cyberattack. In these instances, activating COOP plans that account for such disruptions is key. The COOP plan should ensure that agencies are able to continue performance of essential functions even in the wake of a cyberattack that disrupts access to technology.	In today's world, the delivery of goods and services is heavily reliant of technology for the facilitation of transactions. A cyberattack could significantly disrupt the delivery of goods and services to the extent upon which businesses and entities rely on technology for the delivery of their materials.	Property and facilities may become either uninhabitable or unusable as a result of a cyberattack, particularly if their infrastructure if reliant on technology for sustainability. In addition, a significant majority of critical infrastructure systems are in some way tied to technology, oftentimes through virtual operations and supervisory control and data acquisition (SCADA) systems. Therefore, a cyberattack could disable the vast majority of systems which control these pieces of critical infrastructure, as well as traffic control, dispatch, utility, and response systems.	Targeted cyberattacks can impact water or wastewater treatment facilities. The disruption of the virtual systems tied to this infrastructure could cause water pollution or contamination and subsequent environmental issues. In addition, a cyberattack could impact the environment if a release of a hazardous material was triggered as a cascading effect of the incident.	A significant cyberattack could have glaring ramifications on the state economy. Society is heavily reliant on electronic-based commerce through mobile banking, automated teller machines, and electronic trading. Any disruption to daily activities by a cyberattack can have disastrous impacts to the economy, effectively halting the ability to conduct transactions electronically.	In the case of a cyberattack in which significant amounts of data is stolen, the government's inability to protect confidential personal data would impact confidence in the state. Such an incident would also subsequently cause pause regarding the security of using electronic systems for government services.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Hazardous Materials Release	A hazardous material release event that takes place at a fixed site can have a great impact on the public that lives around that site. The level of impact from this release could vary greater, depending on the type of waste, the amount of contact an individual has with the chemical, and if there is an explosion or fire associated with the event. Immediate notification to the public is critical after a hazardous material release in order to maintain public safety. Public Health Impacts: The public's health can be greatly impacted by a hazardous material release through short or long term contact with a chemical. Exposure can occur through exposure to contaminated water, air, or direct contact.	When hazardous materials are released, a specialized crew of first responders will work to initially contain the spill. First responders put their health and even life at risk if proper precautions and personal protective equipment are not used during a hazardous material release event.	A hazardous materials release event occurring at a fixed site will have an impact on the continuity of operations in the immediate area of the event.	Road and bridge closures, as well as transportation service disruptions, may occur as a result of a hazardous material release in order to protect public safety. The ability to deliver goods and services will be impacted locally and regionally depending on the extent of closures.	Infrastructure and property is at risk of contamination during a hazardous material release and could become generally unusable depending on the nature of the event. An industrial or business site may become impossible to occupy if it's contaminated after a spill. Facilities in the immediate vicinity of a hazardous waste event could become temporarily or permanently uninhabitable due to contamination.	The impact on the environment will vary depending on the location and extent of the contamination. In the event of a hazardous material release, the animals, plants and wildlife surrounding the spill will be impacted. Groundwater and soil can become contaminated when exposed to hazardous material.	A hazardous material release event can be particularly costly to clean up, especially when groundwater and soil have been contaminated. Contamination can travel outward from a spill and leave localities and even regions uninhabitable, especially when water and food stocks are impacted. These affected areas also become less attractive to tourists and the economy.	The public's confidence in county governance will depend entirely on the initial response to a hazardous materials release event. A well planned response to an event can lead to a successful mitigation and the establishment of public confidence in the government's ability to respond.

Hazard	Impact on Public	Impact on Responder	Continuity of Operations (COOP)	Delivery of Services	Property, Facilities, and Infrastructure	Impact on Environment	Impact on County Economy	Public Confidence in the County's Governance
Mass Casualty/Mass Fatality	Cape Coral and Fort Myers are population dense areas of Lee County that could be targets for a mass casualty event, especially one caused by terrorism. The public in an area surrounding an event will be in grave danger.	A mass casualty event can be particularly chaotic for first responders who can become quickly overwhelmed by responding simultaneously to the crisis and consequences of an attack. In the event of a terrorist attack, response could become inhibited due to debris on the road, traffic, or airborne disease/chemicals. Access must be coordinated in order to perform effective rescue efforts. First responders may be targeted in the event of secondary attacks.		Road and bridge closures, as well as transit service disruptions, to protect public safety may be a consequence. If they do occur, the ability to deliver goods and services efficiently will be impacted locally, regionally, or statewide depending on the magnitude of the event and level of service disruptions.	Property and facilities could be damaged as a result of a mass casualty event, especially if explosives are involved. Government facilities may suffer damage of destruction as a result of a terrorist attack. If facilities are affected they may lose their ability to conduct normal operations.	If a biological terrorism attack occurs, the diseases released could damage plants and infect animals. A radiological dispersion device or an improvised nuclear device could have a long term impact on the environment and human health.	Radiological or nuclear attacks could be very costly to remediate. Damage to infrastructure and property from explosives will also be very costly to repair and rebuild.	The public's confidence in county governance will depend entirely on the initial response to a mass casualty event. A well planned response to an event can lead to a successful mitigation and the establishment of public confidence in the government's ability to respond.

Conclusions on Vulnerability Assessment

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment. It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies and technical reports.

Loss Estimates

As described in the hazard-specific estimated loss sections, the County has experienced at least 606 hazard events since 1950, as recorded in the NOAA NCEI Storm Events Database. Table 61 summarizes the estimated annualized damages.

Table 61: Summary of Estimated Annualized Damages by Hazard Type

Hazards	Annualized Occurrence	Per Year Total Damage	Annualized Deaths Reported	Annualized Injuries Reported
Natural Hazards				
Animal/Plant Disease Outbreak	1	$278,000	0	0
Coastal Erosion	0.15	$0	0	0
Drought/Extreme Heat	0.21	$0	0.211	0
Epidemic/Pandemic Disease	1	$0	0.092	0.51
Flood	2.3	$201,000	0	0.0952
Freeze/Extreme Cold	0.76	$1,590,000	0	0
Storm Surge Flooding	0.31	$184,000	0	0
Sustained Wind (Tropical Cyclone)	0.71	$128,000,000	0.0952	1.43
Thunderstorm Winds/Lightning/Hail	6.2	$564,000	0.2	0.467
Tornado	2.1	$951,000	0.0156	0.516
Wildfire	0.72	$59,700	0	0
Manmade Hazards				
Aircraft Crash	0.71	$0	0.857	0.429
Cyberattacks	0.5	$0	0	0
Hazardous Materials Release	0.19	$0	0	0
Mass Casualty/Mass Fatality	0.4	$0	5	21
Totals	17.103	$132,000,000	6.47	24.4

Critical Facilities

As described in each hazard-specific section, hazards with defined spatial extents were intersected with critical facility locations. *Table 62* summarizes the number of critical facilities within Lee County that are exposed to natural hazards like Flood, Wildfire, and Coastal Erosion. The WUI Risk Index includes critical facilities in a Risk Index zone equal to or greater than -5, considered "moderate impact".

Table 62: Critical Facilities Impacted by Flood, Wildfire and Coastal Erosion

City Name	Flood Zone		WUI Risk Index >= -5	Coastal Erosion Zone
City of Bonita Springs	A	1	21,314	N/A
	AE	22		
	X	46		
City of Cape Coral	AE	67	38,825	N/A
	X	51		
City of Fort Myers	A	1	15,146	N/A
	AE	52		
	X	6		
City of Sanibel	AE	29	4,615	N/A
	VE	2		
Town of Fort Myers Beach	AE	14	2,635	14
	VE	11		
Unincorporated County	A	6	110,395	5
	AE	283		
	VE	4		
	X	82		
Village of Estero	AE	23	15,239	N/A
	X	10		

Hazard Ranking

The purpose of the hazard ranking is to categorize and prioritize all potential hazards for Lee County based on risk. Combined with the asset inventory and quantitative vulnerability assessment, the summary hazard classifications allow for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Lee County to consider as part of their proposed mitigation strategy. Each hazard was ranked from 1 (low), 2 (medium), and 3 (high) in four categories, which were then weighted and averaged together to develop a Composite Hazard Index. This index was then used to rank the hazards as High, Medium, or Low overall to give the community some sense of how the hazards ranked in comparison to the others. Table 5 provides a summary of the categories used to rank the hazards and their weighted values for the Composite Hazard Index.

The overall summary of the different hazards is shown in *Table 63*. The four highest priority hazards were Tornados, Thunderstorms, Flooding, and Hurricane Wind Damage and were labeled as composite high priority. The composite

medium priority hazards were Aircraft Crashes, Wildfire, Epidemics Diseases, and Storm Surge Flooding. Violent Incidents, Coastal Erosion, Drought/Extreme Heat, and Cyber Attacks have a low Composite Hazard Index, but ranked high in one or more of the individual categories that make up the composite index.

Table 63: Overall Hazard Priority Summary

Hazard	Probability	Maximum Impact	Probable Hazard Magnitude Death and Injury	Warning Time	Composite Hazard Index
Coastal Erosion	High	Low	Low	Low	Low
Storm Surge Flooding	Low	High	Low	Medium	Medium
Drought/Extreme Heat	Low	Low	High	Low	Low
Flooding	High	High	Medium	High	High
Freeze/Extreme Cold	Medium	Low	Low	Low	Low
Hurricane Wind Damage	Medium	High	High	Medium	High
Thunderstorm Winds/Lightning/Hail	High	High	High	Medium	High
Tornado	High	High	High	High	High
Wildfire	Medium	Medium	Low	High	Medium
Aircraft Crashes	Low	Low	Medium	High	Medium
Cyberattacks	Low	Low	Low	High	Medium
Epidemic/Pandemic Diseases	Medium	Low	High	Medium	Medium
Exotic Pests/Diseases	Medium	Low	Low	Low	Low
Hazardous Materials	Low	Low	Low	Medium	Low
Violent Incidents	Low	Low	High	High	Low

GOALS AND OBJECTIVES

Introduction

This section presents the hazard mitigation goals and objectives to reduce or avoid long-term vulnerabilities to those hazards contained in the vulnerability assessment and the guiding principles underlying the development of these goals and objectives. For the update to be adopted in 2017, the LMS Working Group reviewed and decided to retain the goals and objectives from the previous update.

Guiding Principles

Principles guiding the county's hazard mitigation effort have been identified in the Lee County CEMP's Mitigation Function section. The principles presented her serve as the framework for organizing the Local Mitigation Strategy's Goals and Objectives.

The Local Mitigation Strategy should consider:

- Preventive activities that focus on reducing the risk to people and property from identified hazards.
- Property protection activities to reduce or avert property damage on a building by building or parcel basis.
- Natural resource protection activities to preserve or maintain natural areas.
- Emergency services measures or activities, taken during the disaster incident, caused by an identified hazard, that reduce its impact.
- Structural projects that help keep the hazard's impact away from an identified area.
- Public information activities that advise property owners, potential property owners, and visitors about hazards, and ways to protect people and property from hazards.
- Pre- and post- disaster redevelopment and mitigation policies and procedures designed to reduce or avert the community's future disaster potential

Local Mitigation Strategy Goals and Objectives

Goal 1

Support prevention activities and projects that reduce the risk of life and damage to property from identified hazards.

Objective 1.1

Preventive activities that are addressed in various comprehensive planning and land development regulations shall be governed by the appropriate goals, objectives and policies contained in the following documents:

- City of Bonita Springs: City of Bonita Springs Comprehensive Plan
- Cape Coral: City of Cape Coral Comprehensive Plan Coastal Management Element
- City of Fort Myers: The City of Fort Myers Comprehensive Plan
- City of Sanibel: The Sanibel Plan
- Town of Fort Myers Beach: Fort Myers Beach Comprehensive Plan
- Unincorporated Lee County: Lee Comprehensive Plan and Lee County Land Development Code

Objective 1.2

Continue to support the efforts to purchase environmentally sensitive areas that promote the preservation of open space in specified hazard areas using Conservation 2020 funds, and to leverage other funding sources by working with state land acquisition and land management agencies.

Objective 1.3

Continue to enforce floodplain regulations that provide greater flood protection than required under current National Flood Insurance Program standards.

Objective 1.4

Continue to support the South Florida Water Management District's efforts to increase the storage capacity to retain stormwater in the Estero Watershed.

Objective 1.5

Give high priority to projects that improve the ability of current drainage systems to convey or divert stormwater flooding from areas of the county and municipalities that have suffered repeated flooding events.

Objective 1.6

Beach and dune maintenance projects designed to maintain and preserve the private and public investment of coastal areas shall be funded according to the County's, the component municipalities', Captiva Erosion Prevention District's beach erosion control plans and the Strategic State Beach Management Plan.

Objective 1.7

Continue programs supporting the Lee Plan and municipal comprehensive planning initiatives and land development regulations.

Objective 1.8

Continue enforcement of current land development and floodplain regulations.

Objective 1.9

Continue to support and seek funding for current surface water management program improvements.

Objective 1.10

Review developments falling below SFWMD review for water quantity requirements.

Objective 1.11

Continue current drainage system maintenance program of County canals & roadside ditches.

Objective 1.12

Evaluate and recommend changes to County and municipal codes and ordinances to assure sufficient protection of the public's safety and property to natural and human caused hazards.

Objective 1.13

Continue to implement Long Range Beach Erosion Control planning initiatives.

Objective 1.14

High hazard area developments within already approved development levels should prepare refuge space on site and/or still contribute to shelter space off site.

Goal 2

Support activities and projects that reduce or avert property damage on properties that have suffered repeated damage from identified hazards.

Objective 2.1

Consider projects to acquire and/or relocate repetitive loss properties, as defined by the Federal Emergency Management Agency that have a benefit to cost ratio of 1.0 or better.

Objective 2.2

Consider projects to elevate, or otherwise retrofit, repetitive loss properties, as defined by the Federal Emergency Management Agency, that have a benefit to cost ratio of 1.0 or better.

Objective 2.3

Examine the feasibility of enacting development standards in urban/wild land interface areas to mitigate future fire losses, which will include vegetative buffers, fire-resistant roofing materials, screened gable and roof openings, and minimum driveway width requirements for fire response vehicles.

Objective 2.4

Attempt to improve the county and the component municipalities Building Code Effectiveness Rating System ratings to reduce homeowner insurance policy rates on new construction.

Objective 2.5

Continue and/or enact freeboard requirement for new construction located in the B, C, and X Zones of the community's floodplain.

Objective 2.6

Incorporate hazard mitigation measures in any rehabilitation or reuse of existing public facilities, structures, buildings, and registered historic structures.

Objective 2.7

Hazard-proof existing and proposed critical facilities and registered historic structures, in regards to location and construction.

Goal 3

Support natural resource protection activities that preserve or maintain natural areas.

Objective 3.1

Continue current wetland coordinating/evaluation programs with state and water management agencies.

Objective 3.2

Continue enforcing erosion sedimentation and control regulations that reduce how much sediment enters natural areas when development takes place.

Objective 3.3

Support the continued purchase of lands through several local, state and federal programs that promote the preservation of natural areas.

Objective 3.4

Support the continued efforts to conserve, preserve, and restore forest, wetlands and coastal natural features, and to renourish the beach front and other natural resource areas.

Objective 3.5

Protect and restore the ecological functions of wetland systems to ensure their long-term environmental, economic, and recreational values, including hazard mitigation practices.

Objective 3.6

Promote the use of agricultural practices which are compatible with the protection of natural systems.

Objective 3.7

Reassess build-out population in the Coastal High Hazard area, and determine how it can be reduced. Build-out population can be reduced via public acquisition of lands such as the Conservation 2020 program or other state programs, or through transfer of development rights programs.

Goal 4

Support the achievement of emergency services activities taken during a disaster incident to reduce the hazard's impact.

Objective 4.1

Continue efforts to gain a better understanding of the community's vulnerability to flood, wind, erosion, drought, and wildfire impacts through hazard identification and vulnerability assessment studies.

Objective 4.2

Continue the program to place additional water gauging stations equipped with telemetry access to monitor water/groundwater levels.

Objective 4.3

Continue to support projects that fund building or retrofit projects that reduce the community's hurricane shelter space deficit.

Objective 4.4

Support efforts to fund improvements to critical roadway links causing congestion on evacuation routes.

Objective 4.5

Continue efforts to identify and fund critical facilities that need mitigation protection due to their importance in helping the community respond to and recover from identified hazards.

Objective 4.6

Floodproofing of critical facilities within the defined Coastal High Hazard Area shall receive priority for grant funding requests.

Objective 4.7

Examine the feasibility of designing water, sewer, and power infrastructure facilities so that they can function during significant flooding events.

Objective 4.8

Each component municipality will either prepare a comprehensive emergency management plan (CEMP) or fall under the County's CEMP.

Objective 4.9

Identify and encourage incorporation of emergency power supplies to critical facilities and other public and private facilities integral to the operation, particularly with respect to health and safety support functions.

Objective 4.10

Evaluate the effectiveness of existing emergency power supplies to critical facilities and implement enhancements as needed to provide three to five days of functional operation.

Objective 4.11

Continue to refine the vulnerability assessment of residents and properties to natural and human caused hazards based on the latest scientific and technically based data.

Objective 4.12

Continue developing and refining plans for the safe evacuation of residents exposed to natural and human caused hazards, to include alternative modes of transportation to be used following a disaster.

Objective 4.13

Provide wind protection measures to public buildings that will serve critical roles in response recovery activities.

Objective 4.14

Continue funding current hazard warning program.

Objective 4.15

Identify suitable locations for temporary housing sites.

Objective 4.16

Continue to develop health and safety emergency plans supporting county and municipal comprehensive emergency management plans.

Objective 4.17

Continue to support Geographic Division operations after disasters.

Goal 5

Support efforts to obtain funding for engineered projects that help keep the hazard's impact away from identified vulnerable areas.

Objective 5.1

Seek funding to design and complete capital improvements to improve stormwater flow and water quality to include continuing maintenance of creeks and flow ways, the Clean and Snag program and the Neighborhood Improvement Program for certain communities.

Objective 5.2

Support the policy of using diversions to restore historical water flows and basin boundaries altered due to development, road construction or past agricultural practices and patterns when they pose no adverse impact to nearby properties or when the impact is adequately accommodated.

Objective 5.3

Support efforts to fund channel modifications contained in Lee County's Surface Water Management Plan.

Objective 5.4

Continue to work towards shuttering and floodproofing essential community buildings.

Objective 5.5

Support efforts to restore and maintain beaches that reduce the hazard's impact to vulnerable areas and protect infrastructure.

Goal 6

Encourage public support and commitment to local hazard mitigation efforts by showing its benefits through public information activities that advise property owners, potential property owners, and visitors about hazards, and ways to protect people and property from these hazards and the benefits of protecting our natural resources.

Objective 6.1

Develop and carry out public information programs for hazard mitigation that emphasize its direct benefits to citizens, including the public and private sector.

Objective 6.2

Maintain a comprehensive multi-media /multi-lingual public information strategy to disseminate information programs on hazard mitigation that uses several communication methods, including the public and private library system, the public and private school system, the Lee County All-Hazards Guide, community awareness seminars for citizens and business interests, the community's web sites, and other communication devices such as electronic message boards and social media.

Objective 6.3

Continue to work with community realty associations to improve participation in the voluntary real estate disclosure program for flood hazards.

Objective 6.4

Continue efforts to support funding programs that provide assistance to property owners on ways to mitigate property from identified hazards.

Objective 6.5

Continue current map information programs.

Objective 6.6

Annually send repetitive property loss owners information on ways to reduce flood losses.

Objective 6.7

Continue to distribute Lee County Flood Brochure to local real estate agencies.

Objective 6.8

Encourage participation in the Multijurisdictional Program for Public Information to promote county-wide floodplain management efforts.

Goal 7

Maintain current pre-and post disaster redevelopment and mitigation policies and procedures designed to reduce or avert the community's future disaster potential.

Objective 7.1

Post disaster redevelopment and hazard mitigation policies and procedures shall be governed by goals, objectives and policies contained in Post Disaster Redevelopment Plans.

Objective 7.2

Objectives and policies contained in all existing and developing Post Disaster Redevelopment Plans shall be carried out through the appropriately adopted Post Disaster Ordinances following a major or catastrophic disaster.

Objective 7.3

In areas that have been severely devastated, establish a multi-agency team within the Recovery Task Force to undertake changes to plats or multiple parcel sites to provide for a better community reconstruction strategy, rather than just issuing emergency permits.

Objective 7.4

Consider amending community land development regulations to require eradication of exotic vegetation that poses a health and safety threat to the proposed development or potentially blocks access to response agencies.

MITIGATION INITIATIVES

Introduction

Determining and ranking mitigation initiatives focuses on specific projects that address goals and objectives contained in this Joint Unified Local Mitigation Strategy. This procedure will be carried out by the LMS Working Group using the ranking process described in this section. The current mitigation initiatives projects and their ranking approved by the Working Group are also presented.

On-going programs established to address goals and objectives in the LMS will be identified in an approved action plan. This plan contains a short title or description of the program supporting the mitigation strategy's goals and objectives, the dollar amount set aside in the current budget year for the program, who is responsible for administering the program, and the status of the program's activities. It will also track initiatives that have received funding.

Ranking Mitigation Initiatives

Based on the vulnerability assessment and risk analysis completed in the risk analysis presented in this LMS, hazard mitigation initiatives and projects have been identified. These projects are ranked according to criteria approved by the LMS Working Group. The process focuses on assigning a priority to projects or studies designed to avoid, avert or reduce impacts of identified hazards and further assigns a numerical score that represents its priority based on how well the project meets each identified criterion. The Working Group documents ranking based on the greatest opportunity for loss reduction.

Ranking of proposed projects is conducted by the entire voting LMS Working Group present at the meetings when ranking determinations are made. The sponsoring agency/organization presenting a project for consideration completed a ranking worksheet, assigning a value for each criterion except for the "Level of Public Demand" condition. The Working Group then reviewed the project, assigned a value for the above-named criterion, reviewed the presented score for accuracy, and approved a priority ranking for the proposed project. This process is completed for all projects regardless of jurisdiction or sponsoring agency. Each member organization gets one vote.

Appendix C: Public Involvement and Meeting Materials shows the *Mitigation Initiative Ranking Worksheet* used by project sponsors and the Working Group members to evaluate the mitigation initiatives. Committee members received a completed worksheet for any projects being proposed for inclusion in the Joint Unified Local Mitigation Strategy. Projects were then ranked according to the total number score determined for each project.

The parameters used to rank the projects include the following:

- Addressed in Community Comprehensive Plans, Programs and Policies:
- Consistent with existing regulatory framework:
- Probability of funding:(with local funds)
- Community Rating System Credit
- Community Benefit
- Community Exposure to identified hazard:
- Level of Public Demand, County wide
- Complexity of Implementation:
- Estimated Ratio of Benefit vs. Cost: (FEMA cost benefit analysis preferred)

- Critical Service Improvement:
- Time frame to complete project:

Hurricane shelter projects go through an additional set of parameters that evaluates such factors as: storm surge vulnerability, building construction, increase in shelter capacity, and project cost effectiveness. Any projects submitted for federal funding must include a cost benefit analysis using approved methodology and consider dollars lost to the community.

Mitigation Initiatives

The following pages contain the current Joint Unified Local Mitigation Strategy Initiatives for Lee County. They include the ranking for each project submitted by Lee County and municipalities including the initial score, the public demand score and the total score, its estimated cost, whether the project is eligible for Hazard Mitigation Grant Program (HMGP) funding, and comments on project completion or status.

Each mitigation initiative listed in the table below has been strategically selected for its promising potential to contribute to Lee County's overall reduction in risk.

New 2017 Mitigation Actions

Jurisdiction	Project Name	timated Co	tial Sco	Deman	otal Sco	Potential Fun	Timefra	Hazard(s)	Responsible Dept
Fort Myers Bead	Mid-Island Neighborhoods Drainage Improvement Project, Segment I	$6,600,000	26	4	30	Gen Rev, HMGP	2 years	FL, SURGE	Fort Myers Beach
Fort Myers Bead	Mid-Island Neighborhoods Drainage Improvement Project, Segment II	$7,900,000	27	4	31	Gen Rev, HMGP	1 year	FL, SURGE	Fort Myers Beach
Fort Myers Bead	Mid-Island Neighborhoods Drainage Improvement Project, Segment III	$7,400,000	26	4	30	Gen Rev, HMGP	2 years	FL, SURGE	Fort Myers Beach
Fort Myers Bead	South End Neighborhoods Drainage Improvement Project	$3,400,000	27	4	31	Gen Rev, HMGP	1 year	FL, SURGE	Fort Myers Beach
Fort Myers Bead	North Estero Drainage Improvement Project, Phase	$2,600,000	27	4	31	Gen Rev, HMGP	1 year	FL, SURGE	Fort Myers Beach
Fort Myers	Billy Creek Restoration - Flood Protection	$800,000	36	3	39	Gen Rev, HMGP	1 year	FL, SURGE	Fort Myers
Fort Myers	Caloosahatchee Shoreline	$1,000,000	30	3	33	Gen Rev, HMGP	3 years	FL, SURGE	Fort Myers
Fort Myers	Citywide Canal Armoring	$900,000	33	4	37	Gen Rev, HMGP	1 year	FL, SURGE	Fort Myers
Fort Myers	Citywide Lake Rehabilitation	$850,000	33	2	35	Gen Rev, HMGP	2 years	FL, SURGE	Fort Myers
Fort Myers	Edgewood Neighborhood SWM System Flood Protection	$1,600,000	32	4	36	Gen Rev, HMGP	3 years	FL, SURGE	Fort Myers
Fort Myers	Ridgewood Park Neighborhood SWM System Flood Protection	$1,250,000	32	4	36	Gen Rev, HMGP	3 years	FL, SURGE	Fort Myers
Sanibel	Beach Renourishment	$14,000,000	30	4	34	Gen Rev, HMGP	1-2 years	CE, SURGE	Sanibel
Sanibel	Dredging and restoration of the Sanibel Slough System	$500,000	33	3	36	Gen Rev, HMGP	2-3 years	FL, SURGE	Sanibel
Sanibel	Living Shoreline Projects	$388,000	32	2	35	Gen Rev, HMGP	1-3 years	CE, SURGE	Sanibel
Sanibel	Tahiti/Jamaica Area Drainage	$560,000	32	1	33	Gen Rev, HMGP	1 year	FL, SURGE	Sanibel
Lee County (ALL	Shelter Mitigation (CIP)	$1,500,000	31	4	35	Gen Rev, HMGP	<1 year	ALL	LC Public Safety
Lee County (ALL	Lehigh Senior HS Shelter	$100,000	32	4	36	Gen Rev, HMGP	<1 year	ALL	LC Public Safety
Lee County (ALL	Sunshine Elementary Shelter Retrofit	$35,000	32	4	36	Gen Rev, HMGP	<1 year	ALL	LC Public Safety
Lee County (ALL	Utilities	$1,680,000	28	2	30	Gen Rev, HMGP	2 years	ALL	LC Utilities
Lee County (ALL	County-Wide Public Information and Outreach	$30,000	31	3	34	Gen Rev, HMGP	Ongoing	ALL	ALL
Bonita Springs	Bernwood Business Park Improvements	$750,000	31	3	34	Gen Rev, HMGP	1 year	FL, SURGE	Bonita Springs
Bonita Springs	Spring Creek: Culvert at Cedar Creek Drive	$250,000	31	3	34	Gen Rev, HMGP	1 year	FL, SURGE	Bonita Springs
Bonita Springs	Spring Creek: FPL Right of Way Bridging and Pipes on South	$1,500,000		3	34	Gen Rev, HMGP	1 year	FL, SURGE	Bonita Springs
Bonita Springs	Spring Creek: Milagro Lane Culvert at South Branch	$650,000	31	3	34	Gen Rev, HMGP	1 year	FL, SURGE	Bonita Springs
Bonita Springs	Spring Creek: Rail Road ROW RCP Replacement	$2,500,000	31	3	34	Gen Rev, HMGP	1 year	FL, SURGE	Bonita Springs
Cape Coral	Fire Station 11 Hardening	$100,000	29	4	33	Gen Rev, HMGP	1 year	TC, TH, T, W	Cape Coral
Cape Coral	Fire Station 12 Hardening	$100,000	29	4	33	Gen Rev, HMGP	1 year	TC, TH, T, W	Cape Coral
Cape Coral	Oasis Charter School	$150,000	22	3	25	Gen Rev, HMGP	1 year	TC, TH, T, W	Cape Coral

Active Mitigation Actions

Jurisdiction	Project Name	Estimated Cost	nitial Score	c Demand S	Total Score	Potential Funding	Timeframe	Hazard(s)	Responsible Dept	Comments	2017 Update Comments
Bonita Springs	Rep Loss Property Elevation	$31,200	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Bonita Springs	Awaiting Funding	KEEP ON LIST
Bonita Springs	Rep Loss Property Elevation	$70,000	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Bonita Springs	Awaiting Funding	KEEP ON LIST
Bonita Springs	Rep Loss Property Elevation	$31,562	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Bonita Springs	Awaiting Funding	KEEP ON LIST
Bonita Springs	Rep Loss Property Elevation	$50,000	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Bonita Springs	Awaiting Funding	KEEP ON LIST
Bonita Springs	Rep Loss Property Elevation	$44,959	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Bonita Springs	Awaiting Funding	KEEP ON LIST
Bonita Springs	Rep Loss Property Elevation	$43,850	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Bonita Springs	Awaiting Funding	KEEP ON LIST
Bonita Springs	Rep Loss Property Elevation	$67,735	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Bonita Springs	Awaiting Funding	KEEP ON LIST
Bonita Springs	Rep Loss Property Elevation	$48,400	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Bonita Springs	Awaiting Funding	KEEP ON LIST
Bonita Springs	Rep Loss Property Elevation	$50,000	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Bonita Springs	Awaiting Funding	KEEP ON LIST
Bonita Springs	2012 Bonita Beach Renourishment	$2,666,000	18	2	20	General Rev	2 years	CE, FL, SURGE, TC, TH	Lee County	Ongoing	Check with Natural Resources
Fort Myers Beach	Estero Island Beach Restoration	$2,500,000	32	2	43	Local Funds	5-7 years	CE, FL, SURGE, TC, TH	Lee County		Check with Natural Resources
Fort Myers Beach	Estero Island Canal Dredging	$500,000	23	2	25	HMGP	1-2 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Floodplain Public Outreach	$3,000	23	2	25	Local Funds	Yearly	CE, FL, SURGE, TC, TH	Fort Myers Beach	Ongoing	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$80,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$80,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$113,535	27	1	28	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$80,000	27	1	28	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$80,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$80,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$217,224	28	1	29	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST

Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$75,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers Beach	Rep Loss Property Elevation	$250,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers Beach	Awaiting Funding	KEEP ON LIST
Fort Myers	City Wide Intersection Improvements	$1,200,000	28	2	30	Local Funds	5-7 years	TC, TH, T	Fort Myers	Awaiting Funding	KEEP ON LIST
Fort Myers	City Wide Property Retrofit Program (Rep Loss)	$500,000	22	2	24	General Rev	3-5 years	CE, FL, SURGE, TC, TH	Fort Myers	Awaiting Funding	KEEP ON LIST
Fort Myers	Drainage Project - Ford/Edison Estate	$450,000	34	2	36	General Rev	2 years	FL, SURGE	Fort Foundation	Planning Stages	KEEP ON LIST
Fort Myers	Floodplain Outreach Program	$5,000	23	2	25	General Rev	1 year	FL, SURGE	Fort Myers	Awaiting Funding	KEEP ON LIST
Fort Myers	Wind retrofit for Harborside and STARS complex (Bi-fold shutters)	$300,000				EMPG	1-2 years	TC, TH, T	Fort Myers	Awaiting Funding	

Fort Myers	Water Line Interconnect between Fort Myers, Cape Coral and Lee County	$21,900,000	34	4	38	BCA/PDMG	5 years	TC, TH, T	Public Works	Awaiting Funding	KEEP ON LIST
Lee County	Battery Backup System for Traffic Signals	$110,000	26	2	28	General Rev	1 year	TC, TH, T, W	LC DOT	May be funded under Pre-Disaster Mitigation Funds	
Lee County	Captiva Island Beach Restoration Project	$9,319,400	18	3	21	General Rev	5-7 years	CE, SURGE, FL	LC Natural Resources	Funded	Last completed in 2013
Lee County	Gasparilla Island Beach Restoration Project	$12,149,016	18	3	21	General Rev	5-7 years	CE, SURGE, FL	LC Natural Resources	Funded	Last completed in 2013
Lee County	Gator Slough Channel Improvements	$7,000,000	25	2	27	HMGP	5-7 years	FL, SURGE	LC Natural Resources	Partially Completed	
Lee County	Hazard Tree Removal from Lee County ROW	$1,000,000	40	2	42	General Rev	Ongoing	TC, TH, T, W	LC DOT	Ongoing	
Lee County	NFM Flood Prevention Study	$180,000	26	3	29	General Rev	2-3 years	FL, SURGE	LC Natural Resources	Partially Completed	
Lee County	Pine Island Ditch Exotic Removal	$810,000	31	2	33	General Rev	Ongoing	TC, TH, T, W	LC DOT	Ongoing	
Lee County	Relocate Span-Wire Mounted Street Name Signs to Poles	$485,968	25	1	26	General Rev	1-2 years	TC, TH, T	LC DOT	Ongoing	
Lee County	Replace 1/4" Span Wire with 3/8" Span Wire	$205,000	25	0	25	General Rev	1-2 years	TC, TH, T	LC DOT	Ongoing as Funds Become Available	
Lee County	San Carlos Drainage Improvements	$550,000	27	2	29	HMGP	Ongoing	FL	LC Natural Resources	Partially Completed	Natural Resources?
Lee County	Storm Shutters for 16 County Facilities (including Animal Shelter)	$704,985	40		40	HMGP	2-3 years	TC, TH, T	LC Facilities	3/05 removed from HMGP list; remains on LMS list	
Lee County	Emergency Generator at Lee County EOC (Buckingham Road)	$750,000	26	4	30	HMGP	2-3 years	TC, TH, T, W	LC Public Safety	Ongoing	
Lee County	Suncoast Community Center - Harden and improve to 160mph winds and enlarge the capacity to shelter 500 people	$250,000	32	2	34	All Hazards MTSU, EMPG	1-2 years	TC, TH, T, W	LC Human Services	Ongoing	
Lee County	2012 Lovers Key Beach Renourishment	$2,500,000	18	3	21	City General Funds/TDC Bed Tax	2 years	CE, SURGE, FL	LC Natural Resources	Last done in 2014, next in 2021	Last completed in 2014

Deferred Mitigation Actions

Jurisdiction	Project Name	Estimated Cost	nitial Score	c Demand S	Total Score	Potential Funding	Timeframe	Hazard(s)	Responsible Dept	Comments	2017 Update Comments
Cape Coral	Storm Resistant Public Works Facilities - Everest Compound	$5,000,000	22	2	24	General Rev, EMPG	5-7 years	TC, TH, T	Cape Coral	Defered - Being considered by Public Works to be broken down into smaller projects.	
Cape Coral	Yacht Club Building Storm Hardening	$45,564	22	2	24	General Rev, HMGP	2 years	TC, TH, T	Cape Coral	Defered - Lack of funding	
Cape Coral	Lake Kennedy Senior Center Generator	$45,921	22	2	24	General Rev, HMGP	2 years	ALL	Cape Coral	Defered - Lack of funding	
Cape Coral	EOC Expansion	$1,100,000	31	2	33	All Hazards MTSU	1 year	ALL	Cape Coral	Defered - Lack of funding	
Sanibel	Backup Sewer Capacity	$5,000,000	15	1	16	General Rev	3-5 years	ALL	Sanibel	Defered - Lack of funding	
Sanibel	Beach Restoration Project from Blind Pass to Sanibel Lighthouse	$14,000,000	38	4	42	General Rev	5-7 years	CE, FL, SURGE, TC, TH	Lee County	Defered - Funded will restore in the future	
Sanibel	Critical Structures Elevation (Old name - Design and Construction of Above-Flood Elevation Storage Facility for Emergency Response Vehicles)	$600,000	28	2	30	HMGP	2-3 years	CE, FL, SURGE, TC, TH	Sanibel	Defered Awaiting Funding	
Sanibel	Emergency Dispatch Mobile CAD and RMS Communication System	$140,000	33	2	35	General Rev	1-2 years	ALL	Sanibel	Defered Awaiting Funding	
Sanibel	Emergency Dispatch Mobile Repeater System	$80,800	33	2	35	General Rev	1 year	ALL	Sanibel	Defered Awaiting Funding	
Sanibel	Evacuation Route Road Improvements	$3,600,000	22	3	25	General Rev		ALL	Sanibel	Removed	
Sanibel	Standby Power and Pumping for Wastewater Collection System	$100,000	34	3	37	EMPG	1 year	All	Sanibel	Defered Awaiting Funding	
Sanibel	Civic Center Reconstruction/Re-enforcement	$340,000				General Rev	2-3 years	ALL	Sanibel	Defered Awaiting Funding	
Lee County	Additional rain/stage recorders in North Fort Myers	$31,500	22	2	24	General Rev	1 year	CE, FL, SURGE, TC, TH	LC Natural Resources	Defered - Lack of funding	Joan/Steve Boutelle
Lee County	Briarcliff Drainage Improvements	$550,000	29	2	31	HMGP	2-3 years	FL, SURGE	LC Natural Resources	Defered - Lack of funding	Steve Boutelle
Lee County	Broadway Palm Dinner Theater Hurricane Shelter Retrofit	$26,000	29	3	32	HMGP, EMPG	1 year	ALL	LC Public Safety	Defered - Lack of funding	REMOVE FROM LIST
Lee County	Edison Community College Hurricane Shelter Retrofit (4 buildings)	$78,548	29	3	32	HMGP, EMPG	1 year	ALL	LC Public Safety	Defered Awaiting Funding	REMOVE FROM LIST
Lee County	Greater Pine Island Water Association - Upgrade and replace administrative office and maintenance facility windows with hurricane resistant windows	$12,000	25	0	25	HMGP	1 year	TC, TH, T	Greater Pine Island Water Association	Defered - Awaiting Funding	
Lee County	Greater Pine Island Water Association - Upgrade and replace under-sized bulk diesel tankfuel system for GPIWA Water Plant Emergency Gtenerator w/a 2,000 gallon system	$30,000	31	3	34	EMPG	1 year	TC, TH, T	Greater Pine Island Water Association	Defered - Awaiting Funding	
Lee County	Manna Christian RV Park - Purchase	$3,500,000	19	0	19	HMGP	2-4 years	FL	BOCC	Defered - Awaiting Funding	
Lee County	Powell Creek Bypass Extension	$1,500,000	24	2	26	HMGP	3-5 years	FL, SURGE	LC Natural Resources	Defered - Awaiting Funding	Natural Resources?
Lee County	Real Time Data Forecasting	$125,000	28	2	30	General Rev	1 year	FL, CE, SURGE	LC Public Safety	Defered - Awaiting Funding	REMOVE FROM LIST
Lee County	Rep Loss Property Acquisition	$69,580	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Drainage Project	$2,324	27	1	29	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Elevation	$71,305	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Elevation	$46,376	27	1	28	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Elevation	$72,200	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Elevation	$44,688	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Elevation	$38,507	25	1	26	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Elevation	$51,854	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Elevation	$30,148	24	1	25	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Elevation	$70,000	24	1	25	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Rep Loss Property Elevation	$320,000	26	1	27	HMGP	3-5 years	CE, FL, SURGE, TC, TH	LC Public Safety	Defered - Awaiting Funding	
Lee County	Sheriff's Office Aviation Unit Generator	$25,000	34	2	36	EMPG, SHSGP	1 year	ALL	Sheriff's Office	Defered - Awaiting Funding	
Lee County	Sheriff's Office Emergency Backup Voice and Data System	$600,000	36	4	40	EMPG, SHSGP	1-2 years	ALL	Sheriff's Office	Defered - Awaiting Funding	
Lee County	Traffic Signal Span Replacement with Mast Arms	$2,500,000	24	2	26	HMGP	2-4 years	TC, TH, T	LC DOT	Defered - Awaiting Funding	
Lee County	Unitarian Universalist Church of Fort Myers Hurricane Shelter Retrofit	$97,050	29	3	32	HMGP	1 year	TC, TH, T	LC Public Safety	Defered - Awaiting Funding	
Lee County	Flood Warning Signs - Leutich Lane and Sherrill Lane in Estero	$684	16	1	17	General Rev	<1 year	FL, SURGE	LC DOT	Defered until funding is available	
Lee County	Flood warning Signs - Bartholemew Road	$684	16	1	17	General Rev	<1 year	FL, SURGE	LC DOT	Defered - Awaiting Funding	
Lee County	Target Neighborhood Fire Public Information Project	$5,000	19	1	20	General Rev	<1 year	W	LC Public Safety	Defered - Awaiting Funding	

Completed Mitigation Actions

Jurisdiction	Project Name	Estimated Cost	Initial Score	c Demand	Total Score	Potential Funding	Timeframe	Hazard(s)	Responsible Dept	Comments
Bonita Springs	Retrofit and Storm Shutter Recreation Gymnasium	$1,500,000	30	4	34	HMGP	1-2 years	TC, TH, T	Bonita Springs	Completed
Bonita Springs	Oak/Leitner Creek Cleaning and Snagging	$160,000	29	3	32	General Rev	1 year	CE, FL, SURGE	Bonita Springs	Completed
Bonita Springs	Drainage Improvement - Quinn St/Edith Lane	$200,000	29	1	30	HMGP	3-5 years	FL, SURGE	Bonita Springs	Completed
Fort Myers Beach	Fort Myers Beach Basin - Drainage Improvement Project	$350,000	27	2	29	HMGP	1.5 years	FL, SURGE	Fort Myers Beach	Completed
Fort Myers Beach	North Estero Boulevard Drainage Improvement	$2,200,000	33	2	35	HMGP	4 months	FL, SURGE	Fort Myers Beach	Completed
Fort Myers Beach	Laguna Shores Drainage Improvement	$340,000	29	2	31	HMGP	1-2 years	FL, SURGE	Fort Myers Beach	Completed
Fort Myers Beach	Fort Myers Beach Preliminary Drainage Study	$60,000	29	2	31	Local Funds	1 year	FL, SURGE	Fort Myers Beach	Completed
Fort Myers Beach	Indian Bayou Drainage/Flooding Control	$20,000	23	2	25	Local Funds	1 year	FL, SURGE	Fort Myers Beach	Completed
Fort Myers Beach	Pearl Street Drainage/Flooding Control	$40,000	23	2	25	HMGP	1 year	FL, SURGE	Fort Myers Beach	Deleted (Duplicate)
Fort Myers Beach	Potable Water Interconnect	$1,000,000	27	3	30	Local Funds	2-3 years	ALL	Lee County	Completed
Fort Myers Beach	Primo Drive Drainage/Flooding Control	$20,000	23	2	25	Local Funds	1-2 years	FL, SURGE	Fort Myers Beach	Completed
Fort Myers	Billy's Creek and State Road 90 (First Street)	$2,000,000	26	2	28		1 year	FL, SURGE	Fort Myers	Completed
Fort Myers	City Hall Generator	$120,000	24	2	26		1-2 years	ALL	Fort Myers	Completed
Fort Myers	Critical Facility Engineering Study	$120,000	26	2	28	General Rev	2-3 years	ALL	Fort Myers	Completed
Fort Myers	Dean Park Engineering Study	$250,000	28	2	30	General Rev	1-2 years	FL, SURGE	Lee County	Completed
Fort Myers	Dean Park Neighborhood Engineering Drainage Improvements	$2,000,000	36	2	38	HMGP	1 year	FL, SURGE	Lee County	Completed
Fort Myers	Dean Park Neighborhood Flooding Correction	$2,000,000	25	2	27	HMGP	1 year	FL, SURGE	Lee County	Completed
Fort Myers	Drainage Pipe and Box Culvert Replacements on Lee Street	$3,000,000	23	2	25		1-2 years	FL, SURGE	Fort Myers	Completed
Fort Myers	Manuels Branch Watershed Improvement (formerly Harold Ave Flood Protection)	$3,231,338	34	4	38	HMGP	3-5 years	FL, SURGE	Fort Myers	Completed
Fort Myers	Public Safety Building Retrofit	$146,923	29	2	31	HMGP/EMPG	2-3 years	ALL	Fort Myers	Completed
Fort Myers	Retrofit Existing Public Works Command Center	$90,250	30	2	32	HMGP/EMPG	1-2 years	ALL	Fort Myers	Completed
Fort Myers	Storm Shutters and Harden Building - Edison/Ford Winter Estates	$339,823	30	4	34	HMGP	1 year	TC, TH, T	Ford Foundation	Completed
Cape Coral	Backup Power System - Reverse Osmosis Municipal Water Treatment Plant	$221,000	22	2	24	General Rev	2-3 years	ALL	Cape Coral	Completed
Cape Coral	Cape Coral Fire Station No. 4 Hardening and Elevation	$93,050	39	2	41	HMGP	3-5 years	ALL	Cape Coral	Completed
Cape Coral	Gulf Coast Village Shutter Project	$588,495	28	2	30	HMGP	1 year	TC, TH, T	Cape Coral	Project completed through Hurricane Charley HMGP funding
Cape Coral	Southwest Water Reclamation Facility Storm Shutters	$75,000	22	2	24	General Rev	1 year	TC, TH, T	Cape Coral	Completed
Sanibel	City Hall, Structural Re-enforcement and Hurricane Shutters	$300,000	24	3	27	HMGP	1-2 years	TC, TH, T	Sanibel	Completed
Lee County	Billy's Creek Cleaning	$55,000	26	2	28	General Rev	1 year	FL, SURGE		Completed
Lee County	Burnt Store Drainage Improvements	$1,200,000	30	2	32	HMGP	3-5 years	FL, SURGE	LC Natural Resources	Completed
Lee County	NEXRAIN System	$50,000	24	2	26	General Rev		FL, SURGE		Completed
Lee County	Lee County EOC	$15,351,000	26	4	30	HMGP	2-3 years	ALL	LC Facilities	Completed
Lee County	Restore Weather Stations at Big Carlos Pass and Redfish Pass	$50,000	25	2	27	HMGP	1 year	ALL		Completed
Lee County	Sanibel Toll Facility Structure Elevation	$2,000,000	26	2	28	HMGP	1-2 years	FL, SURGE	LC DOT	Completed
Lee County	Roof Replacement - Emergency Command Center, Page Field Airport	$1,000,000	30	3	33	General Rev	2 years	ALL	LC Port Authority	Completed

Removed Mitigation Actions

Jurisdiction	Project Name	Estimated Cost	nitial Score	Demand	Total Score	Potential Funding	Timeframe	Hazard(s)	Responsible Dept	Comments	2017 Update Comments
Fort Myers Beach	Miramar Street Drainage/Flooding Control	$35,000	23	2	25	HMGP	1-2 years	FL, SURGE	Fort Myers Beach	Deleted (Duplicate)	NOTE AS DUPLICATE
Fort Myers Beach	Pearl Street Drainage/Flooding Control	$40,000	23	2	25	HMGP	1-2 years	FL, SURGE	Fort Myers Beach	Deleted (Duplicate)	NOTE AS DUPLICATE
Fort Myers	Eastwood Golf Course No. 13 Green Public Restroom	$25,000	18	1	19	General Rev	1 year	ALL	Fort Myers	Removed (Lack of interest)	NOTE AS REMOVED - LACK OF INT
Fort Myers	Fort Myers Country Club No. 4 Green Restroom	$30,000	22	2	24	General Rev	1 year	ALL	Fort Myers	Removed (Lack of interest)	NOTE AS REMOVED - LACK OF INT
Fort Myers	Fort Myers Country Club No. 7 Green Restroom	$30,000	22	2	24	General Rev	1 year	ALL	Fort Myers	Removed (Lack of interest)	NOTE AS REMOVED - LACK OF INT
Fort Myers	Install Hurricane Shutters to secure main-entryway at Fort Myers Police Station	$10,000	31	2	33	HMGP	1 year	TC, TH, T	Fort Myers	Delete	NOTE AS REMOVED
Fort Myers	Retrofit Fire Stations 2, 3, 4	$105,000	32	4	36	HMGP	1 year	ALL	Fort Myers	Delete	NOTE AS REMOVED
Fort Myers	L-3 Galloway Canal Dredging	$100,000	24	1	25	General Rev	1 year	FL, SURGE	Fort Myers	Delete (no longer needed)	NOTE AS REMOVED
Fort Myers	Retrofit Lift Station		31	4	35	General Rev	1 year	ALL	Fort Myers	Delete	NOTE AS REMOVED
Cape Coral	Cape Coral Stormwater Improvements	$1,757,428	26	2	28		2-3 years	FL, SURGE	Cape Coral	Deleted March 2005	
Cape Coral	Electric Generator for Cape Coral Public Safety Building	$75,000	22	3	25		1 year	ALL	Cape Coral	Deleted, combined with another project and renamed, see below	
Cape Coral	Information Technology Services - Hazard Mitigation Enhancements	$22,500	22	1	23	General Rev	1 year	ALL	Cape Coral	Removed (Lack of interest)	
Cape Coral	Old City Hall/Police Department Hurricane Shutters	$18,500	22	2	24		1 year	TC, TH, T	Cape Coral	Deleted, combined with another project and renamed, see below	
Cape Coral	Critical Facility Hardening (name tbd, combines Elec Generator for PS Bldg and Old City Hall/PD Hurricane Shutters)	$93,500	22	3	25	HMGP, EMPG	3-5 years	ALL	Cape Coral	Deleted - Future use of building not yet confirmed	
Sanibel	City Hall/Police Department Hurricane Shutters	$18,500	24	2	26	General Rev	1 year	TC, TH, T	Sanibel	Removed - Replaced by new project	NOTE AS REMOVED
Sanibel	Evacuation Route Road Improvements	$3,600,000	22	3	25	General Rev	Ongoing	ALL	Sanibel	Removed	NOTE AS REMOVED
Lee County	Hurricane Shutters for Animal Services	$66,100	31	3	34	HMGP	1 year	TC, TH, T	Animal Services	Removed - Combining with another storm shutter project	NOTE AS REMOVED

PLAN MAINTENANCE

Introduction

This section describes the method and schedule for monitoring, evaluating, maintaining and revising the local mitigation strategy and HIRA on both an annual and a five-year planning cycle. It presents the method and schedule for monitoring and evaluating the strategy. It also identifies other local planning mechanisms available to help implement the goals, objectives and activities presented in the local mitigation strategy. Lastly, this section details how continued public participation in maintaining the local mitigation strategy will be achieved.

Strategy Monitoring, Evaluation and Update

The Lee County Disaster Advisory Council is designated to guide pre-disaster hazard mitigation efforts and on-going mitigation efforts. This council, initially formed in 1990 as the Recovery Task Force, has been established by the County's Post Disaster Ordinance and also serves as the County's Local Mitigation Strategy Workgroup. The Local Mitigation Strategy Workgroup Chair coordinates mitigation activities and is responsible for monitoring the plan. Membership on the council includes:

- County department heads or designees from a variety of administrative and operational agencies;
- Representatives from Lee County Community Development;
- Local planning agency member;
- Community representatives from, hospitals, the Department of Health and utility companies;
- Liaisons from each municipal government in Lee County (Bonita Springs, Cape Coral, Estero, Fort Myers, Fort Myers Beach and Sanibel);
- Sheriff, school, and fire representatives;
- Regional governmental bodies;
- Other representatives as appointed by the Board of County Commissioners of Lee County.

The council meets quarterly, as necessary. Meetings are advertised to the public and official minutes are kept and made available to a variety of agencies, as well as the public. The monitoring of the mitigation initiatives is done at these meetings by allowing the status of the LMS mitigation initiatives to be put on paper and updated in the plan. The recording of this monitoring in the plan is done by the LMS Chair or designee. The HIRA will be reviewed yearly along with the LMS at the quarterly DAC/LMS meetings. The review will be coordinated by the LMS Working Group Chair or designee.

The council also oversees the county's recovery and reconstruction process. It serves as an advisory body to the Board of County Commissioners on recovery, reconstruction, economic redevelopment, and mitigation issues.

Annual Update Process

Florida Administrative Code 27P-22 requires submittal of an annual LMS update to the Florida Division of Emergency Management by the last working weekday of each January. To meet this deadline, the following items will be updated in late December/early January of each year. This update will be completed by the Division of Public Safety with input from Working Group members. The evaluation of the mitigation projects and their applicability to community goals and interests may cause projects to be removed or added to the list at these meetings. Additions and removals will be done by the LMS Chair or designee.

- Working Group membership
- Updated or revised goals and objectives
- Mitigation initiatives
- Existing planning mechanisms
- Changes to the Working Group organization and/or planning process.
- Progress made on approved action plan

Concurrently, an annual evaluation report will also be prepared and submitted to the elected governing bodies, released to the media and made available to the public. The Local Mitigation Strategy Working Group Chair or designee will prepare the report. It will address the following:

- Description of how the report was prepared and submitted to the governing body, released to the media and made available to the public
- How the reader can obtain a copy of the strategy or evaluation report
- A review of each recommendation or action item in the action plan and how much was accomplished during the previous year
- A discussion of why any objectives or action items were not completed or reached or why they maybe behind schedule
- Recommendations for new projects or revised recommendations

Updates to the Local Mitigation Strategy (LMS) and Hazard Identification and Risk Assessment (HIRA) can be made with approval from the Director of Public Safety as long as edits do not change the overall intent of the documents.

Five Year Update Process

To meet the 5-year LMS Update requirement, The Division of Public Safety, with input from Working Group members, will review the entire document to be sure that the information included accurately reflects the status of the County and its jurisdictions. The process that outlined for the annual update will be followed for the 5-Year LMS update. All sections of the LMS document will be updated as necessary.

A full reassessment of hazards and the county's risk and vulnerability will be conducted every 5 years with the LMS update, or when deemed necessary.

Incorporating into Existing Planning Mechanisms

The following planning documents and processes have and will continue to be used to implement the goals, objectives, and initiatives contained in this strategy. They are briefly described along with the responsible party to implement. Members of the Working Group provide technical assistance and coordinate with their agencies to integrate concepts in the LMS into their respective codes and ordinances.

County and Municipal Comprehensive Plans

These plans contain goals, objectives and policies to guide the pre-disaster mitigation programs to address natural disasters, hazardous materials and fire. For example, the county plan contains a goal specially addressing hazard mitigation (Goal 110). Within that goal is a policy to adopt and maintain a flood plain management plan that analyzes the flooding problem of the unincorporated areas of Lee County, inventory the flood hazard area, review possible activities to remedy identified flooding problems, select appropriate alternatives, and formulate a schedule for

implementation (Policy 110.1.5). Adoption of this local mitigation strategy will incorporate the requirements of this comprehensive plan policy.

Florida Statues allow local governments to amend comprehensive plans several ways. The regular amendment cycle is the option most likely to be used to incorporate or implement local mitigation strategy. Amendments to comprehensive plans are usually considered once a year. Deadlines for applications vary by community.

Responsible Parties: Lee County- Community Development Division of Planning; City of Bonita Springs; Town of Fort Myers Beach; City of Cape Coral; City of Fort Myers; City of Sanibel.

County and Municipal Capital Improvement Programs (CIP)

These programs are planning and budgetary tools that rank project funding to reflect a community's infrastructure needs for a given time period (usually five years). In Florida, these programs consist of projects that comply with the government's comprehensive plan. They are used to fund projects and programs that avert or reduce both current and future damage potential to existing and new buildings to certain hazard types.

These programs are updated annually. Amendments to CIPs are usually made before the next annual review period and approved by the community's elected governing body.

Responsible Parties: Lee County- Public Safety, Department of Transportation, Construction and Design Utilities, Solid Waste and Natural Resources; City of Bonita Springs; Town of Fort Myers Beach; City of Cape Coral; City of Fort Myers; City of Sanibel.

County and Municipal Land Development Regulations, Zoning Ordinances and Building Codes

Land development regulations or codes usually contain a codification of the land development ordinances of a community. They can be used to carry out actions that mitigate damage to new buildings and structures through design considerations. They also can be used to define type, density and intensity of land uses in identified areas that account for natural and human caused hazards. Examples of codes that can be used to mitigate hazards contained in this strategy include the Florida Building Code (structural), the Fire Prevention Code (fire and life safety), the Lee County Coastal Construction Code and each community's Flood Plain Management Ordinance. Low density zoning categories can also be used to reduce the amount and type of land uses exposed to certain types of hazards.

Advisory committees are used by Lee County to review changes to land development regulations. These committees (Land Development Advisory Committee and Executive Regulatory Oversight Committee) meet on a regular basis to review and recommended changes to proposed County ordinances and regulations. Once finalized, these changes are sent to the governing body for public hearings.

Responsible Parties: Lee County- Community Development Division of Planning, Division of Development Services; City of Bonita Springs; Town of Fort Myers Beach; City of Cape Coral; City of Fort Myers; City of Sanibel.

Strategic Plans

Used by governmental and private agencies alike to identify the long-term direction to be taken in carrying out the agency's defined mission, these plans can be used to identify strategies, tasks, projects and time frames to accomplish local mitigation strategy related goals and objectives. These plans usually focus on projects but also could be used to define an agency's or elected body's policy toward mitigating risk to identified hazards.

Surface Water Management Plans

Lee County maintains plans that identify existing flow ways, streams and runoff rates for watershed basins and provides recommendations for protection and improvement of each flow way and stream. This is done to protect lands from additional flooding that might be caused from downstream developments.

Each plan is approved by the Board of County Commissioners.

Responsible Party: Lee County Surface Water Program, Division of Natural Resources Management.

Beach Management Plan

This plan addresses the restoration and maintenance needs of the County's beaches that are in a critical state of erosion. This addresses mitigation efforts related to the erosion hazard.

Responsible Party: The Coastal Advisory Council is a Board of County Commissioner appointed body overseeing the maintenance of this plan. It holds monthly public meetings to discuss and review projects and to establish the budget to expend tourist tax funds for beach related activities.

The Lee County Post Disaster Ordinance (07-20)

The ordinance establishes the organizational framework for addressing hazard mitigation issue and policy development, the duties and responsibilities of the Disaster Advisory Council and the Post Disaster Recovery Task Force, the duties and responsibilities of the position designed to coordinate hazard mitigation activity in the post disaster setting, and the county's build-back policy for repairing and rebuilding damage structures.

Responsible Party: Lee County Division of Public Safety, Emergency Management.

Lee County Community Wildfire Protection Plan(s)

These plans are designed to address a specific wildfire problem to a community. They can take a variety of forms and usually address local forest or range conditions, values-at-risk and priorities for action. At a minimum, they identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that, if completed, reduces to wildfire risk to the community. Mostly likely the wildfire vulnerability analysis in the updated will be reviewed by the contractor hired by the state. Other wildfire mitigation initiatives include Firewise and the Ready, Set, Go program as well as wildfire mitigation efforts in Lehigh Acres.

Responsible Parties: Florida Forest Service

Comprehensive Emergency Management Plan

This document contains elements which address natural and man-made emergencies which effect the County. The comprehensive emergency management plan outlines the purpose, organization of, responsible agencies and officials of Lee County in the mitigation of, preparation for, response to, and recovery from emergencies and disasters. In the last update of the CEMP, the information required for the LMS for repetitive loss properties was integrated into this plan.

Responsible Party: Lee County Division of Public Safety, Emergency Management.

Fort Myers Water Front Visioning Plan

This plan outlines a vision for development along the Fort Myers down town water front. The critical facility list updated during the planning process was used to identify the critical facilities in this smaller geography within the county and a critical facilities map was produced for the waterfront area.

Responsible Party: Florida Department of Economic Opportunity

Continued Public Involvement

The Working Group will continue to include the public in its LMS process. To that end, efforts to reach out to more sectors of public will be used. Some of these efforts follow:

- Make the Joint Unified LMS document available for review at local libraries and governmental offices.
- Place the LMS document and/or links to it on several websites to increase exposure. These websites include, but are not limited to, the Lee County official website, each participating municipal official website, and the Southwest Florida Regional Planning Council website.
- Continue to place announcements of future LMS Working Group meetings on websites or in the newspaper to increase exposure.
- Continue to take and publish official minutes of working group meetings via email.
- Email will be utilized as a way to communicate with Working Group members and the public.

APPENDICES

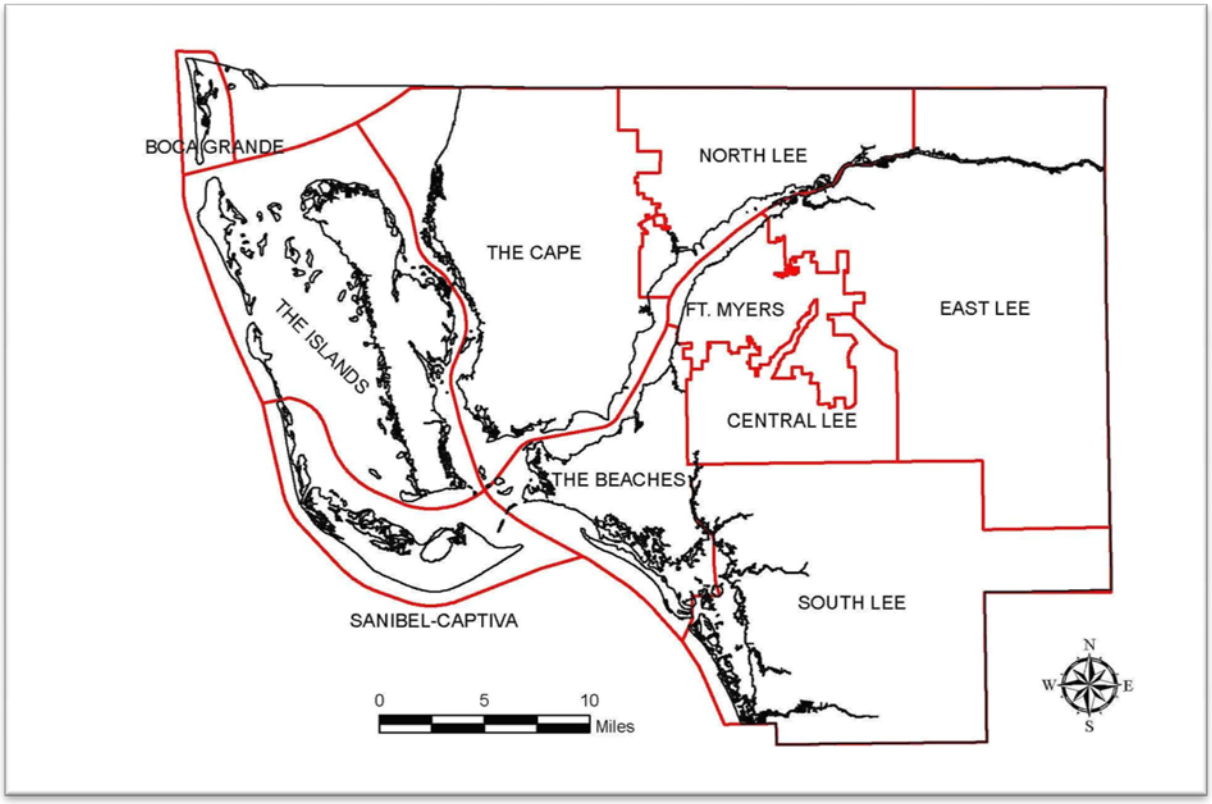
Appendix A: Development Trends

Introduction

This section analyzes the county's land use and development trends, presents population and residential land use projections by Disaster Response Divisions (DRDs) and proposes several observations regarding potential future risk to complement the Hazard Identification and Risk Assessment presented in this document. The projections are made to the year 2030 which allows the analysis to be consistent and use data contained in the Lee Comprehensive Plan (Lee Plan).

The ten Disaster Response Divisions in Lee County are: the Beaches, Boca Grande, the Cape, Central Lee, East Lee, Fort Myers, the Islands, North Lee, Sanibel-Captiva, and South Lee. *Figure 27* shows the boundaries of these ten Disaster Response Divisions. Each Jurisdiction in Lee County is represented by a Different DRD. The City of Bonita Springs is within the South Lee DRD, the City of Cape Coral falls within the Cape DRD, The City of Fort Myers falls within the Fort Myers DRD, the Town of Fort Myers Beach is within the Beaches DRD, and the City of Sanibel is within the Captiva Sanibel DRD. Unincorporated Lee County is within several of the DRDs.

Figure 27: Disaster Response Divisions



The Lee Plan uses Planning Communities as the geographical unit to base population projections and future land use allocations. These Planning Communities do not correspond to the DRDs used in this section. To understand the

size of the current population and built environment and where Lee County will be in 2030 the current and future projections by Traffic Analysis Zones (TAZ) were used. The Traffic Analysis Zones are much smaller than the Planning Communities and fit more precisely into the DRDs. The TAZ's are delineated and updated by the Lee County Metropolitan Planning Organization. The Lee Plan's Future Land Use Map displays location of the future land uses categories by type, density and intensity and is also contained in this section as a reference.

Future Land Use and Development Trends

The following was taken from the Lee Plan, Chapter 1 to describe the future vision of communities within each disaster response division.

The Beaches

Town of Fort Myers Beach - will continue to have a strong retail base for

tourist needs and the daily needs of the residents; however, major consumer and commercial needs will be met outside of this community. The population of this community is very influenced by seasonal factors. This community is nearly built out today and will not have a substantial increase in permanent population by the year 2030.

Iona McGregor Area - The McGregor Blvd. /San Carlos Blvd area will be approaching build out by and some of the older (pre-1980) developments will begin to redevelop to take advantage of a higher end market seeking a combination of quick beach access and closeness to urban services. This area will remain primarily residential with retail uses located at the major intersections. The Summerlin Road Corridor will develop a new look by 2030 and will emerge as one of the county's primary medical service areas. This portion of the community will also continue to develop as a strong residential area with an influx of new gated communities. The San Carlos Island area, which is nearly built out today, will continue to develop its infill areas while maintaining its marine oriented nature.

Boca Grande

The population is highly seasonal with peak population residency and daily visiting occurring during the months of November through May. With land vacancy of less than 15%, Gasparilla Island/Boca Grande has virtually no capacity for additional new development. It will look substantially the same in 2030 as it does today.

The Cape

Cape Coral – Development in the City of Cape Coral will be stimulated by the expansion of the international airport, the construction of the new university, and the availability of reasonably-priced lots with public water and sewer. The imbalance between the city's population and its relatively small commercial and industrial sectors will continue to present a challenge in spite of the city's success in promoting the S.R. 78 corridor as an employment center.

Burnt Store – While remaining primarily residential with a high percentage of seasonal residents with some commercial and marine oriented amenities, this area is expected to double its dwelling units during the life of this plan from 917 in 1996 to over 2000 in 2030.

Central Lee

The South Fort Myers - Will continue to be a core area of the county providing office area for professional services in areas such as financial and medical and will see an increased amount of commercial activity along the US 41 corridor and light industrial uses will continue to expand along the Metro Avenue corridor north of Daniels Parkway. The amounts of commercial and industrial uses in this community are expected to double and most of the suitable land for these uses will be developed by 2030.

The Daniels Parkway – Will have some rural characteristics which will remain in existence through the year 2030; however, much of the existing vacant land will be developed into low density gated communities.

The Gateway Community - is anticipated to grow from 1,500 permanent residents in 1996 to approximately 8,000 in 2030 and is expected to have fewer than 1,000 units remaining to be built in the year 2030.

The Southwest Florida International Airport - Will be greatly expanded by 2030. The expanded airport will have a second parallel runway and a new terminal building that will more than double the existing capacity of the airport.

The portion of the area south and west of Gateway and the airport and extends west of I-75 along Alico Road -. The airport expansion and the completion of Florida Gulf Coast University are expected to increase commercial and industrial development and while not expected to build out by 2030, the area will be much more urbanized with hitech/ clean industry businesses.

East Lee

Alva - Slow residential and commercial growth and likely remain largely rural /agricultural.

Fort Myers Shores - Areas like Caloosahatchee Shores are expected grow substantially by 2030, both residentially and commercially and accommodate the needs of neighboring communities such as Alva, Bayshore, and Buckingham. Older urban areas like Palm Beach Boulevard are likely to experience significant demographic and economic change over the next decade.

Lehigh Acres - will continue to grow through the year 2030 at a rate faster than the county average growth rate and continue to struggle with providing sufficient non-residential uses to accommodate a community of its size.

Fort Myers

The community of Fort Myers remains an administrative, financial, and cultural center for the rest of Lee County and this is not expected to change by the year 2030. The population of the Fort Myers community will also grow from the current 57,000 permanent residents in 1996 to over 86,000 permanent residents in 2030. The seasonal influx of residents in the Fort Myers community is not as great as in other areas of the county.

The Islands

Upper Captiva, Cayo Costa, Useppa, Buck Key and Cabbage Key – Will remain much as they do today and will rely completely upon outside communities for commercial needs.

Pine Island - Will likely see modest growth, and a viable and productive agricultural community. Recent zoning changes will likely see it continue to be a haven between urban sprawl approaching from the mainland and the

wealth of the outer islands. Traffic constraints caused by the narrow road link to the mainland will limit future development, allowing the islands to evacuate from storms and protecting natural lands from unsustainable development.

North Lee

North Fort Myers – The old US 41 corridor will be redeveloped with new commercial uses and waterfront development taking advantage of this areas close proximity to downtown Fort Myers and its riverfront location. The US 41 corridor from Pondella Road north will continue to attract new commercial development that will serve the North Fort Myers community and other surrounding communities. Most of the North Fort Myers community will develop at residential densities consistent with what is allowed by the Lee Plan Future Land Use Map.

Bayshore -- This community is predominantly a rural residential area of single family homes on large acreages, small horse farms, citrus groves, and plant nurseries, interspersed by some larger cattle grazing operations. There are also scattered single-family subdivisions and mobile homes on smaller lots, which provide for a full range of housing prices. There is limited urban infrastructure and commercial uses and residents of this area want to see this land use pattern maintained.

Sanibel/Captiva

Sanibel – The City remains a destination for residents and tourists and will continue to look much as it does today with nominal population growth

Captiva – This Island is not expected to greatly change by 2030 and will look much as it does today in the absence of a major hurricane or other natural disaster.

South Lee

Bonita Springs – One of the fastest growing communities in Lee County, the City is expected to nearly double in population between 1996 and 2030 with an expected 2030 permanent population of approximately 37,000. The Bonita Community will also remain an attractive seasonal homeowner destination and has an anticipated Seasonal Population of 61,000 in the year 2030. This community will have only 20% of its total land area remaining vacant or in agricultural use in the year 2030.

San Carlos Park, Estero, and the area around Florida Gulf Coast University – Expected to experience tremendous development pressures as this community explodes into the next century. Most of the vacant property in this community (nearly 70%) has some type of development approval most of which were granted prior to the advent of many of these new development engines. This area will emerge as an urban core for Lee County's high-tech research and development employment base.

Potential Future Risk

The following tables list dwelling units and population projections by disaster response division and compare these results with 2007 unit and population data to indicate what growth rate each area may experience.

Table 64: Dwelling Unit Projections by Disaster Response Division

Disaster Response Division	2007 Single Family Units	2007 Multi Family Units	2007 Total	2030 Single Family Units	2030 Multi Family Units	2030 Total	Unit Change
The Beaches	19,871	32,531	52,402	16,387	38,548	54,935	2,533
Boca Grande*			1,226			1,570	344
The Cape	63,356	13,719	77,075	102,370	36,184	138,554	61,479
Central Lee	12,041	14,312	26,353	18,015	25,707	43,722	17,369
East Lee	33,576	12,495	46,071	58,679	35,270	93,949	47,878
Fort Myers	14,665	16,811	31,476	19,220	30,312	49,532	18,056
Islands	4,994	3,305	8,299	5,108	4,107	9,215	916
North Lee	9,726	15,514	25,240	17,568	38,681	56,249	31,009
Sanibel/Captiva	4,028	3,874	7,902	4,074	3,930	8,004	102
South Lee	29,729	38,885	68,614	37,982	54,269	92,251	23,637
County Total	191,986	151,446	344,658	279,403	267,008	547,981	203,323

Sources: Housing Units – Lee County DCD/Planning Division, Lee County TAZ Data, Lee County Property Data Analysis conducted for 2011 update
Population – Lee County TAZ Data, Lee County DCD/Planning Division, Planning Communities Data
*Limited Data available for Boca Grande Disaster Response Division

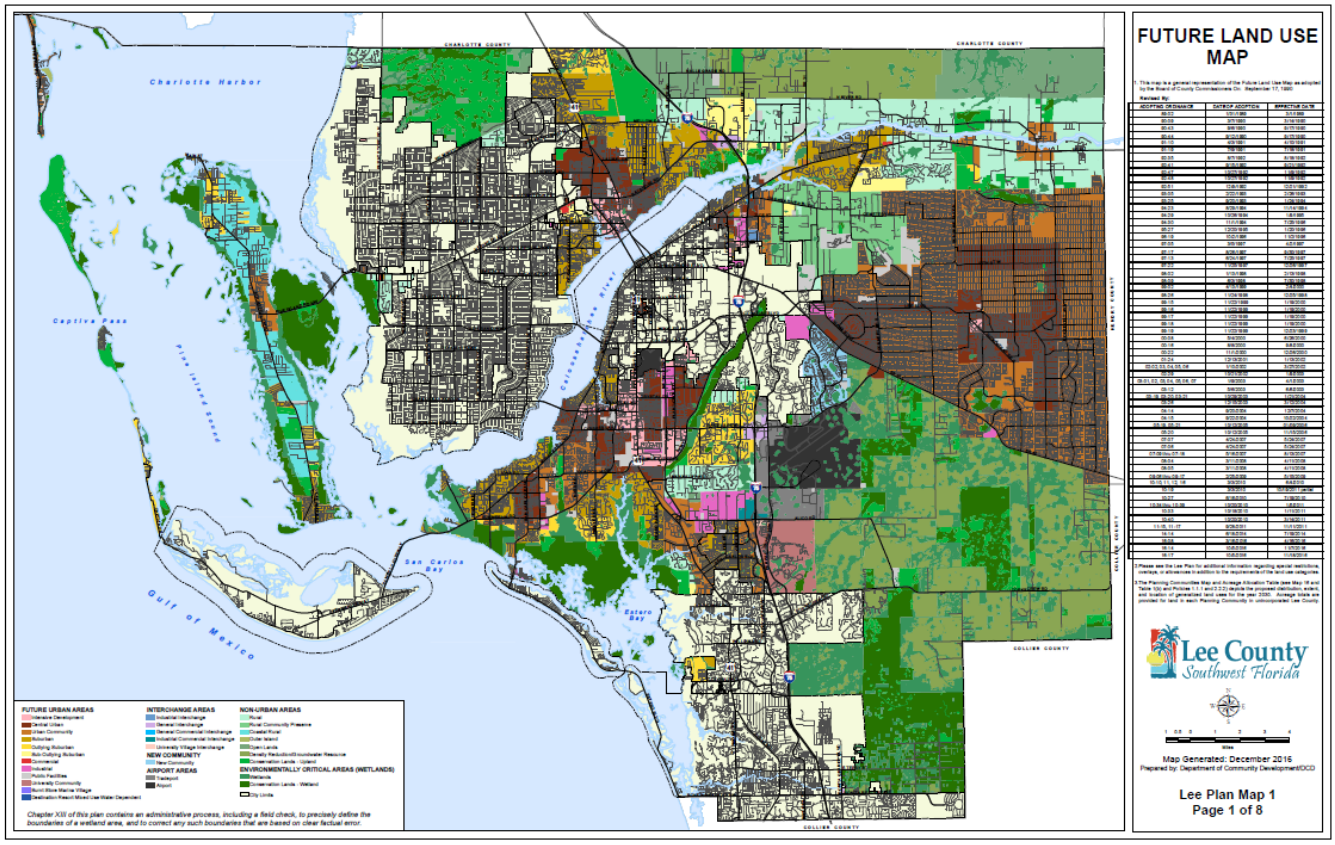
Table 65: 2030 Population Projection by Disaster Response Division

Disaster Response Division	2007 Population	2030 Population	Population Change
The Beaches	65,900	75,310	9,410
Boca Grande	1,214	1,531	317
The Cape	168,556	314,201	145,645
Central Lee	46,357	68,849	22,492
East Lee	96,506	163,308	66,802
Fort Myers	60,946	82,023	21,077
Islands	10,498	11,810	1,312
North Lee	39,583	84,581	44,998
Sanibel/Captiva	6,450	6,575	125
South Lee	100,552	131,381	30,829
County Total	596,562	939,569	343,007

Sources: Population – Lee County TAZ Data, Lee County DCD/Planning Division, Planning Communities Data

The Cape Division is expected to see the largest growth, almost doubling in size by the year 2030. East Lee will see the next highest growth followed by followed by North Lee and South Lee. The growth is these four Disaster Response Divisions will make up nearly 85% of expected future growth. The growth rates of Divisions closest to the coast will be lower due to either low density limits are because they are at build out. The Central Lee and Ft. Myers Divisions may experience a moderate growth increase.

Figure 28: Future Land Use Map



Appendix B: LMS Ranking Worksheet

PROJECT NAME (or brief Description): _____

JURISDICTION: _____

Addressed in Community Comprehensive Plans, Programs and Policies:

- County/City Comprehensive Plan
- Capital Improvement Program
- Five - year Strategic Plan
- Land Development Codes, Zoning Ordinances, Building Codes
- Surface Water Management Plans
- Beach Management Plans
- Floodplain Management/Hazard Mitigation Plans
- Other environmental, conservation, preservation and/or reclamation plans or programs

Score	4	Project is addressed in at least four (4) items listed
	3	Project is addressed in at least three (3) items listed
	2	Project is addressed in at least two (2) items listed
	1	Project is addressed in at least one (1) item listed
	0	Project is not addressed in any item listed

Consistent with existing regulatory framework:

- County, City Land Development Codes
- County, City Environmental Statutes
- County, City Wetland Regulations

Score	4	Project fits within existing regulatory network
	3	Project requires a change or waiver in one of the items listed
	2	Project requires a change or waiver in two of the items listed
	1	Project requires a change or waiver in all items listed above
	0	Project requires changes or waivers that extend the time line to complete the project

Probability of Funding:(with local funds)

Score	4	Funding can be accomplished through matching local dollars from other sources, or a blend of funding sources
	3	Funding could only be accomplished through post-disaster funding options
	2	No local funding sources can be identified
	1	Funding is available through local short term budgeting
	0	Funding is available through local long term budgeting

Community Rating System Credit

Score	4	Open Space Preservation, Drainage System Maintenance or Storm-water Management Project
	3	Flood Damage Reduction Project (acquisition, relocation, elevation)
	2	Flood Preparedness Project
	1	Public Outreach Project
	0	Project that will provide no improvement to the community's Community Rating System score

Community Benefit:

- City of Bonita Springs
- City of Cape Coral
- Village of Estero
- City of Fort Myers
- City of Sanibel
- Town of Fort Myers Beach
- Unincorporated Lee County

Score	4	Project benefits all communities
	3	Project benefits four (4) of the communities listed
	2	Project benefits three (3) of the communities listed
	1	Project benefits two (2) of the communities listed
	0	Project benefits one (1) of the communities listed

Community Exposure:

- Repetitive exposure to damage
- High risk or other specific problem

Score	4	Project mitigates a high risk problem based on the community's vulnerability assessment
	3	Project mitigates a repetitive loss property as defined by FEMA (a property having two or more flood losses of $1,000 or greater within a ten year period)
	2	Project mitigates loss of essential services to the community
	1	Project mitigates documented damage resulting from a recent disaster
	0	Project mitigates loss of potential future damage

Level of Public Demand, County wide: (Select this score with the LMS Group)

Score	4	Very High interest and public support
	3	High interest and public support
	2	Moderate interest and public support
	1	Low interest and public support
	0	No interest and public support

Estimated Ratio of Benefit vs. Cost:

Score	4	Benefit/cost ratio = 4.0 or greater
	3	Benefit/cost ratio = 3.0 - 3.9
	2	Benefit/cost ratio = 2.0 - 2.9 or benefit /cost ration not applicable or quantifiable
	1	Benefit/cost ratio = 1.0 - 1.9
	0	Benefit cost ratio < 1.0

Complexity of Implementation:

- Time involved for planning and/or completion
- Numerous agencies and/or jurisdictions involved
- Permitting (type and time period) involved
- Public vote required
- Public hearing required
- Environmental impact assessment

Score	4	Relatively easy project to put in place, in a short period of time
	3	Project not that complex to put in place based on items listed
	2	Project somewhat complex due to one (1) of the items listed
	1	Complex project due to at least two (2) of the items listed
	0	Complex project due to at least three (3) or more of the items listed

Critical Service Improvement:

Score	4	Project reduces vulnerability of critical service necessary for life biologically (power, water, sewer, gas, medical care facility)
	3	Project reduces vulnerability of critical services necessary for life safety and security (law enforcement, fire, telecommunications, emergency shelters, evacuation route)
	2	Project reduces vulnerability of hazardous facility (facility storing extremely hazardous substance)
	1	Project reduces vulnerability of a business considered an essential service (fueling facility, food retail outlet)
	0	Project does not reduce vulnerability of an identified critical service

Time frame to complete project:

Score	4	One (1) year to complete
	3	Two (2) years to complete
	2	Three (3) years to complete
	1	Four (4) years to complete
	0	Five (5) years or more to complete

HURRICANE SHELTER DEFICIT PROJECTS

Storm Surge Vulnerability

Score	4	Outside Category 4/5 evacuation zone
	3	Inside Category 4/5 evacuation zone, floor above category 3 flood
	2	Inside Category 3 evacuation zone, floor above category 3 flood
	1	Inside Category 3 evacuation zone, floor below category 3 flood
	0	Inside Category 2 evacuation zone

Building Construction

Score	4	Heavy Construction
	3	Moderate Hurricane Resistance
	2	Some Hurricane Resistance
	1	Light Construction
	0	Information not available

Project Improvement

Score	4	Improves structural integrity of building envelope from wind and flood effects
	3	Improves structural integrity of building envelope from wind effects
	0	Does not improve structural integrity of building envelope from wind and flood effects

Facility's Potential Use as Hurricane Shelter Managed by American Red Cross

Score	4	Project will mitigate identified deficiencies in the facility that will allow Red Cross to manage facility
	3	Project will mitigate identified deficiencies in the facility that will allow other sheltering agency to manage facility
	2	Project will mitigate major deficiencies in the facility that will allow it to be used as a refuge of last resort
	0	Project will not mitigate identified deficiencies in the facility

Increase in Shelter Capacity

Score	4	1000 or greater additional spaces
	3	500 - 999 additional spaces
	2	150 - 499 additional spaces

Building Availability

Score	4	Public facility/Full availability
	3	Private facility/Full availability
	2	Public facility/Limited availability
	1	Private facility/limited availability

Project Cost Effectiveness

Score	4	Less than $100 per shelter space
	3	$101 - $150 per shelter space
	2	$151 - $200 per shelter space
	1	$201 - $250 per shelter space
	0	Greater than $250 per shelter space

COMPILATION OF SCORES	
Score	**Criterion**
	Addressed in community comprehensive plans, programs and polices
	Consistent with existing regulatory framework
	Probability of funding (with local funds)
	Community Rating System (CRS) credit
	Community benefit
	Community exposure
	Level of Public Demand
	Estimated ratio of benefit vs. cost (for FEMA projects)
	Complexity of implementation
	Critical service improvement
	Time to complete project
	Total Score

Date Completed: _____

Scoring performed by: _____ Disaster Advisory Council Post Disaster Recovery Task Force

Authorized Official:

_____

Printed Name: _____

Signature

Appendix C: Public Involvement and Meeting Materials

August 22, 2016

Public Notice

The News-Press media group
news-press.com A GANNETT COMPANY

Classified Ad Receipt
(For Info Only - NOT A BILL)

Customer:	LCBC-COUNTY ADMINISTRATION	**Ad No.:**	0001493197
Address:	2115 2ND ST FORT MYERS FL 33901 USA	**Net Amt:**	$252.92
Run Times:	1	**No. of Affidavits:**	1
Run Dates:	08/15/16		

Text of Ad:

PUBLIC NOTICE

County's Local Mitigation Strategy Update

PLEASE BE ADVISED that Lee County Emergency Management will hold a public meeting where concerns and comments will be heard in order to update the County's Local Mitigation Strategy. The first meeting will be held on **Monday, August 22, 2016 at 2:00pm at the Lee County Emergency Operations Center** (2675 Ortiz Ave, Fort Myers, FL 33905).

The Local Mitigation Strategy (LMS) establishes a plan to make the County safer from a variety of hazards and to reduce long term deaths and property damage. Federal rules require that local governments maintain a Local Mitigation Strategy to receive several types of disaster related assistance grants. Public comment is a federal requirement for plan approval.

Lee County Emergency Management encourages the public to view the draft version of the plan at the website: https://www.leegov.com/publicsafety/emergencymanagement/plan/mitigation

Comments on the plan can be directed to: Lee Mayfield, Lee County Public Safety/Emergency Management, 239-533-0622, lmayfield@leegov.com.

Public input in the development of the Local Mitigation Strategy will ensure that the money is spent on mitigation projects that benefit the community most. Lee County Emergency Management needs help in identifying places that are at risk to natural hazards and projects that could be carried out to mitigate the hazards. Hazard mitigation actions include: prevention, property protection, public education, natural resource protection, emergency services protection and structural projects. Lee County Emergency Management is looking for mitigation project ideas.

Persons with disabilities who need an accommodation to participate in the public hearing should contact Lee Mayfield, 239-533-0622, lmayfield@leegov.com. To ensure availability of services, please request accommodation as soon as possible but preferably five or more business days prior to the event. Persons using a TDD may contact Lee Mayfield through the Florida Relay Service, 711.

PO#WESTEN REF#L081516-106
AD#1493197 August 15, 2016

Sign-In Sheet

	A	B	SIGN IN SHEET for 8/22/2016	D	E
2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
3	Abes, Ben	Lee County Public Safety	benjamin.abes@leegov.com	(239) 533-3961	
4	Ahmadi, Kevin		kevina@gulfcoastvillage.org		
5	Barden, Jack	Equal Opportunity Analyst	jbarden@leegov.com	(239) 533-2201	
6	Baucom, Warren	Lee County Economic Development	wbaucom@leegov.com	(239) 338-3161	
7	Beck, Richard	Lee County Public Works Dept.	Rbeck@leegov.com	(239) 533-8822	
8	Benacquisto, Senator Lizbeth		benacquisto.lizbeth.web@flsenate.gov		
9	Bjostad, James	Lee County Emergency Mgmt	Jbjostad@leegov.com	(239) 533-0617	
10	Blood, Valerie	Lee County Emergency Mgmt	vblood@leegov.com	(239) 533-0610	
11	Bowen, Trenton Chief	City of Fort Myers Fire Dept.	Tbowen@cityftmyers.com	(239) 321-7311	
12	Brady, Christine	Lee County Human Resources Director	cbrady@leegov.com	(239) 533-2348	
13	Bridges, Sandi	Lee County Emergency Mgmt	sbridges@leegov.com	(239) 533-0615	
14	Brown, Pam	Visitors Bureau / Conference & Event Manager	pbrown@leegov.com	(239) 338-3500	
15	Cain, John	American Red Cross	disaster@arclee.org	(239) 278-3401	
16	Campbell, Chris	City of Bonita Springs	Christopher.Campbell@cityofbonitasprings.org		
17	Campbell, Gerald	Emergency Manager - FGCU	gcampbell@fgcu.edu	(239) 590-1948	
18	Carter, Cindy	Lee County Parks & Recreation	ccarter@gmail.com	(239) 229-0493	
19	Carter, Linda	No Person Left Behind	mslindacarter@gmail.com	(239) 368-6846	
20	Cassidy, Frank	City of Bonita Springs	frank.cassidy@cityof bonitasprings.org	(239) 949-6257	
21	Cloutier, Peter	Internal Services / Mgr. Internal Serv. - Fiscal	pcloutier@leegov.com	(239) 533-8512	
22	Cochran, Don Chief	City of Cape Coral Fire Department	dcochran@capecoral.net		
23	Crawford, David		dcrawford@swfrpc.org		
24	Crisafulli, Susan	LCEC	susan.crisafulli@lcec.net	(239) 656-2399	
25	Dalton, Lt. William	Sanibel Police Department	bill.dalton@mysanibel.com	(239) 472-3111	
26	Davis, Jenny	Public Safety / Administrative Specialist	jldavis@leegov.com	(239) 533-3948	
27	Deerey, Aaron	Lee County Port Authority	amdeerey@flylcpa.com	(239) 590-4696	
28	Delrose, L	City of Fort Myers	ldelrose@cityftmyers.com		
29	Dobson, Kenny	School District of Lee County	KennethDD@leeschools.net	(239)0839-9083	
30	Doggett, Linda	Lee Clerk of Courts	ldoggett@leeclerk.org	(239) 533-2554	
31	Donley, Liz	Charlotte Harbor National Estuary Program	ldonley@chnep.org		
32	Drake, Dylan	Lee County Human Resources	Draked@leegov.com	(239) 533-2005	

	A	B	SIGN IN SHEET for 8/22/2016	D	E
2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
33	Duncan, Danny	Sanibel Fire	Danny@sanibelfire.com		
34	Duncan, Gary E.	Lee County Port Authority	GEDuncan@flylcpa.com	(239) 590-4721	
35	Dunn, Brandon	Lee County Community Development	bdunn@leegov.com	(239) 533-8809	
36	Eck, Caitlyn	Lee County Health Department	Caitlyn.Eck@flhealth.gov	(239) 461-6128	
37	Eckert, Timothy	Parks & Recreation	teckert@leegov.com	(239) 432-2076	
38	**Farmer, Rob - DAC Chair**	Lee County Public Safety Director	rfarmer@leegov.com	(239) 533-3911	
39	Fenske, Jennifer	Lee County Public Safety	jfenske@leegov.com	(239) 533-3922	
40	Flanjack, Alise	Lee County Parks & Recreation	aflanjack@leegov.com	(239) 533-7451	
41	Floyd, William	Lee County Emergency Mgmt	wfloyd@leegov.com	(239) 533-0611	
42	Fournier, Celeste	Lee County Emergency Mgmt	cfournier@leegov.com	(239) 533-0694	
43	Fournier, Jason	Lee County Solid Waste	JFournier@leegov.com	(239) 338-3302	
44	Frantz, Joe	Lee County DOT Operations	frantzja@leegov.com	(239) 533-8400	
45	Fraser, Andrea	Lee County Attorney	afraser@leegov.com	(239) 533-2236	
46	Gabrick, Eileen	Lee Clerk of Courts	egabrick@leeclerk.org	(239) 533-2124	
47	Gibbons, John	Southwest Florida Regional Planning Council	Jgibbons@SWFRPC.org	(239) 338-2550	
48	**Gooderham, Kate - Vice Chair**	Gooderham & Associates	kgooderham@comcast.net	(239) 489-2616	
49	Goyette, Paul	Lee County Lee Tran	pgoyette@leegov.com	(239) 533-0343	
50	Grant, Damon	Lee County Construction & Design	dgrant2@leegov.com	(239) 281-9086	
51	Grigsby, Melanie R	City of Ft. Myers	Mgrigsby@cityftmyers.com	(239) 321-7487	
52	Guirguis, Ehab	Lee County DOT Operations	eguiguis@leegov.com	(239) 533-8400	
53	Gulamali, Al	Lee County Port Authority	AnGulamali@flylcpa	(239) 590-4720	
54	Hamilton, Rebecca	Examiner	rhamilton@leegov.com	(239) 277-5020	
55	Hanna, Rebecca	Public Safety / Office Manager	rhanna@leegov.com	(239) 533-3973	
56	Harner, David	Parks and Recreation / Director	dharner@leegov.com	(239) 533-7408	
57	Harris, David	Budget Services / Manager, Budget Services	dharris@leegov.com	(239) 533-2301	
58	Hartwell, Judy	City of Fort Myers Fire Dept.	jhartwell@cityftmyers.com	(239) 321-7321	
59	Hawes, Karen	County Administration / County Manager	khawes@leegov.co.	(239) 533-2221	
60	Hayden, Kenneth	Community Association Manager	Ken@Hayden-Associates.com	(239) 489-4890	
61	Hayhurst, Patrick	Lee County School Dist.	PatrickJH@leeschools.net	(239) 337-8598	

	A	B	SIGN IN SHEET for 8/22/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
62	Henninger, Lance	Sanibel Emergency Management	emergency.management@mysanibel.com	(239) 472-3111	
63	Henningson, John - Boca Grand		jchningson@aol.com		
64	Higgins, Douglas	Lee County Public Safety	dhiggins@leegov.com	(239) 533-3916	
65	Higginbotham, Tom	Fort Myers Fire Department	thigginbotham@cityftmyers.com		
66	Hunter, Arleen	City of Bonita Springs	arleen.hunter@cityofbonitasprings.org		
67	Ink, James				
68	Jackson, Tricia	Lee County Budget Services	tjackson@leegov.com	(239) 533-2309	
69	Jacoby, Billie	Community Development	Bjacoby@leegov.com	(239) 533-8948	
70	Jerant, Andy	American Red Cross	andy.jerant@redcross.org		
71	Jordan, James	City of Sanibel	jimmy.jordan@mysanibel.com	(239) 472-4136	
72	Kazemi, Saeed	City of Ft. Myers	skazemi@cityftmyers.com	(239) 321-7215	
73	Keyes, Pam	Lee County Utilities	Pkeyes@leegov.com	(239) 533-8544	
74	Kinsey, Philip	Bonita Fire	Kinsey@bonitafire.org		
75	Kirton, Kim	Public Resources / Administrative Specialist	kkirton@leegov.com	(239) 533-2107	
76	Klein, Bonnie	Facilities Construction & Management Life Safety	bklein@leegov.com	(239) 707-5668	
77	Kreiger, Lisa	Natural Resources / Operations Manager	LKreiger@leegov.com	(239) 533-8706	
78	Kreuz, Jeanette	Fort Myers Police Department	jkreuz@fmpolice.com	(239) 321-7759	
79	LaGuardia, Joan	Lee County Community Development	jlaguardia@leegov.com	(239) 533-8705	
80	LaMontagne, Timothy	Solid Waste / Solid Waste Coordinator	tlamontagne@leegov.com	(239) 533-8960	
81	Larsen, Sandy	City of Sanibel	sandy.larsen@mysanibel.com	(239) 472-6397	
82	Lassiter, Trish	LCEC	Trish.Lassiter@lcec.net	(239) 292-3143	
83	Le-Blanc-Hutchings, Lisa	Lee County Port Authority	llleblanc-hutchings@flylcpa.com	(239) 590-4852	
84	Liggins, Mike		MLiggins@bsu.us		
85	Love, Jim	Lee County Health Department	James.Love@flhealth.gov	(239) 690-2103	
86	Lovejoy, Donna	City of Fort Myers	dlovejoy@cityftmyers.com	(239) 321-7217	
87	Loveland, David	Lee County Dept. of Transportation	Lovelad@leegov.com	(239) 478-8509	
88	Lucia, Scott Captain	Lee County Sheriff's Dept.	SLucia@Sheriffleefl.org	(239) 477-1086	
89	Mallow, Terry	Lee Clerk of Courts	tmallow@leeclerk.org	(239) 533-2184	
90	Manzo, Barbara	Lee County Parks & Recreation	Barbara@leegov.com	(239) 533-7412	
91	Marichal, Terry	Public Safety / Administrative Specialist	cmarichal@leegov.com	(239) 533-3964	
92	Margolis, Senator Gwen		margolis.gwen.web@flsenate.gov		
93	Mayfield, Lee	Lee County Emergency Mgmt	Lmayfield@leegov.com	(239) 533-0620	

	A	B	SIGN IN SHEET for 8/22/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
94	Mazurkiewicz, Heather	Lee Building Industry Assoc.	Heather@bia.net	(239) 936-5525	
95	Mercado, Roger	Lee County Human Services	rmercado@leegov.com	(239) 533-7930	
96	McGee, Jim	Lee County Historic Preservation Board	jmdgee@otc1.com	(239) 671-6267	
97	McIntyre, Ed	Lee County Parks & Recreation	Mcintyee@leegov.com	(239) 590-0554	
98	Miller, Rita	Lee Clerk of Courts	rmiller@leeclerk.org		
99	Moore, Steven Chief		scmoore@fgcu.edu		
100	Murphy, Gerald	Murphy Planning	jerry@murphyplanning.com	(239) 322-8510	
101	Myers, Steve	Lee County Transit	Slmyers@leegov.com	(239) 277-5012	
102	Nelson, Stanley		snelson@sheriffleefl.org		
103	Nesbit, Chief Larry	Bayshore Fire & Rescue	Chief@bayshorefire.org	(239) 543-3443	
104	Noble, Matthew	DCD Planning / Principal Planner	mnoble@leegov.com	(239) 533-8548	
105	Norvell, Jeremy	Lee County DOT	jnorvell@leegov.com	(239) 533-9400	
106	Ottolini, Roland	Natural Resources / Division Director	rottolini@leegov.com	(239) 533-8127	
107	Pigott, Tamara	Visitors and Convention	tpigott@leegov.com	(239) 533-6715	
108	Porter, Gary	Manager	gporter@leegov.com	(239) 498-0157	
109	Pringle, Bonnie		Bonniegiwa@comcast.net		
110	Quimby, Debbie	Lee County Emergency Management	dquimby@leegov.com	(239) 533-3640	
111	Richardson		urichardson@ralaw.com		
112	Richter, Garrett Senator		richter.garrett.web@flsenate.gov		
113	Ringle, Rachel	Cape Coral Emergency Management	ringle@capecoral.net	(239) 242-3635	
114	Rodgers, Michelle	Lee County Emergency Management	mrodgers@leegov.com	(239) 533-0605	
115	Rodriguez, Alberto Dr	Lee County School District	AlbertoR@leeschools.net	(239) 337-8106	
116	Rooker, Kathleen		mycepd8@gmail.com		
117	Sampson, Lindsey	Lee County Solid Waste	sampsolj@leegov.com	(239) 338-3302	
118	Schwing, Carl	City of Bonita Springs	carl.schwing@cityofbonitasprings.org		
119	Scott, Denise	Lee County Website Coordinator Content	dscott@leegov.com	(239) 533-2306	
120	Seeley, Ellen	City of Cape Coral Fire Dept.	eseeley@capecoral.net	(239) 573-3022	
121	Simmons, Clay	Lee County DOT	wsimmons@leegov.com	(239) 533-8803	
122	Smith, Holly	Private Citizen of Sanible	boatclub411@gmail.com	(239) 707-9800	
123	Solich, John	Lee County DOT Operations	jsolich@leegov.com	(239) 533-9400	
124	Southall, Robert	Lee County Transit	rsouthall@leegov.com	(239) 533-0363	
125	Spearo, Jesse	Cape Coral Emergency Management	jspearo@capecoral.net	(239) 242-3611	

	A	B	SIGN IN SHEET for 8/22/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
126	Stead, Ken		ken@swfmia.com		
127	Stelmacki, Sonny	Lee County School Dist.	Sonnyas@leeschools.net		
128	Stewart, Bob	Lee County Building Services	Rstewart@leegov.com	(239) 533-8320	
129	Tapfumaneyi, Sandra	Lee County Emergency Mgmt	stapfumaneyi@leegov.com	(239) 533-0614	
130	Tomlinson, Bill	City of Sanibel Police Dept.	Bill.tomlinson@ci.sanibel.fl.us	(239) 472-3111	
131	Trescott, Dan	SW FL Regional Planning Council	DTrescott@swfrpc.org	(239) 338-2550 x220	
132	Vance, Audrey	City of Bonita Springs	audrey.vance@cityofbonitasprings.org		
133	Vidal, Denis	LCEC	denise.vidal@lcec.net		
134	Wade, Doug	Lee Memorial	dwade@leememorial.org		
135	Weis, Dan	Construction and Design	dweis@leegov.com	(239) 707-6719	D.R.W
136	Walker, Tim	SWFL Regional Planning Council	twalker@swfrpc.org	(239) 338-2550	[illegible]
137	Wheaton, Patti	Medical Examiners Office, Lee County	Pwheaton@leegov.com	(239) 277-5020	
138	Will, Megan	Town of Fort Myers Beach	Megan@FortMyersBeachFL.gov	(239) 765-0202	[illegible]
139	Wilson, Hans	SW FL Marine Industries Association	hans@hanswilson.com	(239) 656-7083	
	Smith, Jennifer	RERA Region 6 - DOH	Jennifer.Smith5@FLHealth.gov	850-[illegible]-1271	
	Beals, Nathan	Lee County Utilities	nbeals@leegov.com	239-533-8157	
	Trescott, DAN	SWFRPC Consultant	trescott@embarqmail.com	239-850-7163	[illegible]
		Intern Lee county Management	Intern		[illegible]
	Massey, David				

Meeting Minutes

DISASTER ADVISORY COUNCIL LMS WORKING GROUP MEETING

August 22, 2016

Baucom, Warren – Lee County Economic Development
Beals, Nathan - Lee County Utilities
Blood, Valerie - Lee County Emergency Management
Brown, Pam - Visitors Convention Bureau
Campbell, Gerald – Florida Gulf Coast University
Carter, Cindy – Lee County Parks & Recreation
Cassidy, Frank – City of Bonita Springs
Dalton, William – Sanibel Police Department
Davis, Jenny - Lee County Public Safety
DiPiero, Patty – Lee County Utilities
Eck, Caitlyn – Lee County Health Department
Farmer, Rob – Lee County Public Safety
Fenske, Jennifer – Lee County Public Safety
Fournier, Celeste - Lee County Emergency Management
Gooderham, Kate - Gooderham & Associates
Goyette, Paul – Lee County Lee Tran
Guirguis, Ehab – Lee County DOT
Hartwell, Judy – City of Fort Myers Fire Dept.
Jacoby, Billie – Lee County Community Development
LaGuardia, Joan – Lee County Community Development
Le-Blanc-Hutchings, Lisa – Lee County Port Authority
Massey, David – Intern Lee County Management
Mayfield, Lee - Lee County Emergency Management
Quimby, Debbie - Lee County Emergency Management
Rodgers, Michelle - Lee County Emergency Management
Seeley, Ellen – City of Cape Coral Fire Department
Smith, Jennifer – Lee County Health Department
Trescott, Dan – SWFRPC Consultant
Weis, Dan – Construction and Design
Walker, Tim – SWFL Regional Planning Council
Will, Megan – Town of Fort Myers Beach

Agenda Items

- LMS bid process update
- Review and feedback of key components
    - Introduction/Purpose
    - Benefits
    - Planning Process
    - Hazard Identification
    - Vulnerability Assessment
    - Development Trends
    - Goals and Objectives
    - Project List
- Public Input and Comment

Rob Farmer, Public Safety Director opened the meeting at 2:00 pm on 8/22/16.

Introduction/Purpose – Rob Farmer

As we move forward the LMS Working Group is going to be very important for our plan. Just want to make sure we give our best in the continued weeks to have as much representation as we can from all our municipalities and partners. Lee will talk about the RFP that is out and when you bring projects back from your organization to get approval for the list. When it's time we will be using Roberts Rules to approve those projects as they come forward. We appreciate everyone being here and if you have any questions please don't hesitate to ask.

Introduction/Purpose - Lee Mayfield

I think we have all 6 six municipalities here accept the City of Fort Myers. If you have not signed in, please remember to do this. A lot of what we do in this process has to be documented on the checklist, and participation is one of them. This is the first meeting that we publically noticed; in the News Press and posted on the County website. We will be scheduling a meeting for September and you will come with your new projects. The purpose is to lessen the impact of the disasters and a tool for establishing funding. If projects are not ranked on the list we do not get any funding. We want to make sure that the process and projects are listed and that we comply with all the other plans. Need to update historic structures, top employers, target neighborhoods, and critical facilities.

Requests for Proposals - Lee Mayfield

This has been a joint effort between us and Lee County Emergency Management. The Bid closes on August 31st and bid evaluations on September 7th. This is a plan update and not a plan creation so we are not starting from a blank sheet of paper. We will work with the vendor after they are awarded.

Benefits - Lee Mayfield

This is making sure that certain funding sources are available. We need the ability to accept that money; supporting more effective pre and post disaster mitigation things like shelters. We have not really addressed this on the project list in the last 5 years, but need to make sure it is still consistent with what we want. When putting projects on the list it is justification for other grants that you apply for, so not only for disasters.

Planning Process - Lee Mayfield

There is a whole section on the planning process and this meeting is part of that. We will have to edit how we went through it. If you read the current process it talks about two interns that worked with this committee

& GIS to compile the data and information. The new narrative will reflect current process for updating this plan like we are doing today. There will be a series of meetings that will occur. These meetings will be publically advertised per the State requirements. Probably by December, January or February timeframe we will have a draft copy of the final plan to review. That plan will be sent out to all of you to review and edit. Question: How long does it take your cities to get something on your agenda/schedule? Answer: Roughly two weeks.
We need to have this plan fully reviewed by the middle of June.

Hazard Identification – Celeste Fournier

You should have a copy of the current version Lee County Vulnerability Analysis 2016 in front of you. Anything that has a red asterisk is something that is more addressed in the Local Mitigation Strategy Plan normally. The LMS usually only discusses natural hazards and does not cover man-made hazards. This is a complete list that covers all hazards and threats for Lee County. In the LMS you will only go through the items that need to be addressed, (the red asterisks) some in depth and some not so in depth. The list is based on the 2010 census and we will get it updated when the new one comes out. This list includes man made hazards although it's not required in this plan, but we wanted to be consistent with this study.

Vulnerability Assessment - Lee Mayfield

This is the detailed information on values and estimated losses in vulnerable areas for each hazard. We will have GIS and other program software that we will be able to pull this information from.

Development Trends - Lee Mayfield

Land development trends, population and development projections, potential future risk; Geographic Divisions and Planning Communities; Risks associated for each hazard. When we activate the EOC for a disaster we use 10 geographic divisions and this is how we run response. We will probably keep this the same, unless someone wants to change this.

Goals and Objectives - Lee Mayfield

1) Support prevention activities and projects that reduce the risk of life and damage to property from identified hazards.
2) Support activities and projects that reduce or avert property damage on properties that have suffered repeated damage from identified hazards.
3) Support natural resource protection activities that preserve or maintain natural areas.
4) Support the achievement of emergency services activities taken during a disaster incident to reduce the hazard's impact.
5) Support efforts to obtain funding for engineered projects that help keep the hazards impact away from identified vulnerable areas.
6) Encourage public support and commitment to local hazard mitigation efforts by showing its benefits through public information activities that advise property owners, potential property owners, and visitors about hazards, and ways to protect people and property from these hazards and the benefits of protecting our natural resources.
7) Maintain current pre and post disaster redevelopment and mitigation policies and procedures designed to reduce or avert the community's future disaster potential.

My job will be to go through this and reach out to the point of contact for this plan to see if this something needs to be removed, added or edited. If you have comments or questions on any of this, please email or call me. I think most of these goals and objectives are generic procedures, but in some cases they will have to be edited.

Plan Maintenance Process - Lee Mayfield

This plan is formally updated every 5 years, but sits on the shelve too much. Once we do a clean sweep of this plan, edit and add projects we will probably get better at this and will have a better strategy for monitoring this evaluation list in the future.

- Project List Updates

General city update of where you are at on this project list: On the handout Mitigation Initiatives, page 2 - Moving forward you will have to go through this scoring process on the worksheet. Will also, send out more details that tells what projects are allowed and who can approve. If you have any questions, before these meetings, please email or call anytime.

William Dalton / Sanibel Police Dept. – We are reviewing this list and all the different departments are going to submit any plans or projects they want. I'm personally going to put together a project to get funding to buy satellite phones for a back up communication that operates two way radios. It will allow us to put them in the control cars if we had a situation where communication gets wiped out. Other departments will kick in other ideas, as well.
Judy Hartwell / Fort Myers Fire Dept. – Will bring 2 new projects forward-both drainage improvements just started on and within the next month will have more information.
Frank Cassidy / City of Bonita Springs – We are reviewing the list and not making any changes at this time. We will be ready in a month with some suggestions.
Ellen Seeley / City of Cape Coral – We don't have any projects right now to add. What's on the list needs to come off of the list, either completed or plans have changed. The key for us is bringing together our community development department and our public works department to get their buy in which has been somewhat of a struggle based on other priorities they have.
Scott / City of Estero – We will be ready; have a question on Bonita Springs/loss property evaluation on list. The property with flooding or for county to buy out, so they don't flood year after year.
Kate Gooderham - #109 Lee County Gasparilla Island Beach Restoration Project-Funded, not sure what that means and should be someone to check other than Marine Services.

- Public Input and Comment

We will probably set up our EM Website to be a portal to leave comments and post feedback there.
Suggested next meeting is September 19th at 2:00 pm.

Gerald Campbell - Is the plan to purge the whole list entirely? Good question. We will need to review the list and will have to state why project is done, so basically redoing the list.

Adjourn

Motion to adjourn made by William Dalton, Seconded by Kate Gooderham.
Meeting adjourned at 2:53 PM

September 19, 2016

Public Notice

The News-Press
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PUBLIC NOTICE

County's Local Mitigation Strategy Update

PLEASE BE ADVISED that Lee County Emergency Management will hold a public meeting where concerns and comments will be heard in order to update the County's Local Mitigation Strategy. The meeting will be held on Monday, September 19th, 2016 at 2:00pm at the Lee County Emergency Operations Center (2675 Ortiz Ave, Fort Myers, FL 33905).

The Local Mitigation Strategy (LMS) establishes a plan to make the County safer from a variety of hazards and to reduce long term deaths and property damage. Federal rules require that local governments maintain a Local Mitigation Strategy to receive several types of disaster related assistance grants. Public comment is a federal requirement for plan approval.

Lee County Emergency Management encourages the public to view the draft version of the plan at the website: https://www.leegov.com/publicsafety/emergencymanagement/plan/mitigation

Comments on the plan can be directed to: Lee Mayfield, Lee County Public Safety/Emergency Management, 239-533-0622, lmayfield@leegov.com.

Public input in the development of the Local Mitigation Strategy will ensure that the money is spent on mitigation projects that benefit the community most. Lee County Emergency Management needs help in identifying places that are at risk to natural hazards and projects that could be carried out to mitigate the hazards. Hazard mitigation actions include: prevention, property protection, public education, natural resource protection, emergency services protection and structural projects. Lee County Emergency Management is looking for mitigation project ideas.

AD#1560175 9/12/16

Sign-In Sheet

	A	B	SIGN IN SHEET for 9/19/2016	D	E
2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
3	Abes, Ben	Lee County Public Safety	benjamin.abes@leegov.com	(239) 533-3961	
4	Ahmadi, Kevin		kevina@gulfcoastvillage.org		
5	Barden, Jack	Equal Opportunity Analyst	jbarden@leegov.com	(239) 533-2201	
6	Baucom, Warren	Lee County Economic Development	wbaucom@leegov.com	(239) 338-3161	
7	Beck, Richard	Lee County Public Works Dept.	Rbeck@leegov.com	(239) 533-8822	
8	Benacquisto, Senator Lizbeth		benacquisto.lizbeth.web@flsenate.gov		
9	Bjostad, James	Lee County Emergency Mgmt	Jbjostad@leegov.com	(239) 533-0617	
10	Blood, Valerie	Lee County Emergency Mgmt	vblood@leegov.com	(239) 533-0610	
11	Bowen, Trenton Chief	City of Fort Myers Fire Dept.	Tbowen@cityftmyers.com	(239) 321-7311	
12	Brady, Christine	Lee County Human Resources Director	cbrady@leegov.com	(239) 533-2348	
13	Bridges, Sandi	Lee County Emergency Mgmt	sbridges@leegov.com	(239) 533-0615	
14	Brown, Pam	Visitors Bureau / Conference & Event Manager	pbrown@leegov.com	(239) 338-3500	
15	Cain, John	American Red Cross	disaster@arclee.org	(239) 278-3401	
16	Campbell, Chris	City of Bonita Springs	Christopher.Campbell@cityofbonitasprings.org		
17	Campbell, Gerald	Emergency Manager - FGCU	gcampbell@fgcu.edu	(239) 590-1948	
18	Carter, Cindy	Lee County Parks & Recreation	ccarter@gmail.com	(239) 229-0493	
19	Carter, Linda	No Person Left Behind	mslindacarter@gmail.com	(239) 368-6848	
20	Cassidy, Frank	City of Bonita Springs	frank.cassidy@cityof bonitasprings.org	(239) 949-6257	
21	Cloutier, Peter	Internal Services / Mgr. Internal Serv. - Fiscal	pcloutier@leegov.com	(239) 533-8512	
22	Cochran, Don Chief	City of Cape Coral Fire Department	dcochran@capecoral.net		
23	Crawford, David		dcrawford@swfrpc.org		
24	Crisafulli, Susan	LCEC	susan.crisafulli@lcec.net	(239) 656-2399	
25	Dalton, Lt. William	Sanibel Police Department	bill.dalton@mysanibel.com	(239) 472-3111	
26	Davis, Jenny	Public Safety / Administrative Specialist	jldavis@leegov.com	(239) 533-3948	
27	Deerey, Aaron	Lee County Port Authority	amdeerey@flylcpa.com	(239) 590-4696	
28	Delrose, L	City of Fort Myers	ldelrose@cityftmyers.com		
29	Dobson, Kenny	School District of Lee County	KennethDD@leeschools.net	(239)0839-9083	
30	Doggett, Linda	Lee Clerk of Courts	ldoggett@leeclerk.org	(239) 533-2554	
31	Donley, Liz	Charlotte Harbor National Estuary Program	ldonley@chnep.org		
32	Drake, Dylan	Lee County Human Resources	Draked@leegov.com	(239) 533-2005	

	A	B	SIGN IN SHEET for 9/19/2016	D	E
2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
33	Duncan, Danny	Sanibel Fire	Danny@sanibelfire.com		
34	Duncan, Gary E.	Lee County Port Authority	GEDuncan@flylcpa.com	(239) 590-4721	
35	Dunn, Brandon	Lee County Community Development	bdunn@leegov.com	(239) 533-8809	
36	Eck, Caitlyn	Lee County Health Department	Caitlyn.Eck@flhealth.gov	(239) 461-6128	
37	Eckert, Timothy	Parks & Recreation	teckert@leegov.com	(239) 432-2076	
38	**Farmer, Rob - DAC Chair**	Lee County Public Safety Director	rfarmer@leegov.com	(239) 533-3911	
39	Fenske, Jennifer	Lee County Public Safety	jfenske@leegov.com	(239) 533-3922	
40	Flanjack, Alise	Lee County Parks & Recreation	aflanjack@leegov.com	(239) 533-7451	
41	Floyd, William	Lee County Emergency Mgmt	wfloyd@leegov.com	(239) 533-0611	
42	Fournier, Celeste	Lee County Emergency Mgmt	cfournier@leegov.com	(239) 533-0694	
43	Fournier, Jason	Lee County Solid Waste	JFournier@leegov.com	(239) 338-3302	
44	Frantz, Joe	Lee County DOT Operations	frantzja@leegov.com	(239) 533-8400	
45	Fraser, Andrea	Lee County Attorney	afraser@leegov.com	(239) 533-2236	
46	Gabrick, Eileen	Lee Clerk of Courts	egabrick@leeclerk.org	(239) 533-2124	
47	Gibbons, John	Southwest Florida Regional Planning Council	Jgibbons@SWFRPC.org	(239) 338-2550	
48	**Gooderham, Kate - Vice Chair**	Gooderham & Associates	kgooderham@comcast.net	(239) 489-2616	
49	Goyette, Paul	Lee County Lee Tran	pgoyette@leegov.com	(239) 533-0343	
50	Grant, Damon	Lee County Construction & Design	dgrant2@leegov.com	(239) 281-9086	
51	Grigsby, Melanie R	City of Ft. Myers	Mgrigsby@cityftmyers.com	(239) 321-7467	
52	Guirguis, Ehab	Lee County DOT Operations	eguirguis@leegov.com	(239) 533-8400	
53	Gulamali, Al	Lee County Port Authority	AnGulamali@flylcpa	(239) 590-4720	
54	Hamilton, Rebecca	Examiner	rhamilton@leegov.com	(239) 277-5020	
55	Hanna, Rebecca	Public Safety / Office Manager	rhanna@leegov.com	(239) 533-3973	
56	Harner, David	Parks and Recreation / Director	dharner@leegov.com	(239) 533-7408	
57	Harris, David	Budget Services / Manager, Budget Services	dharris@leegov.com	(239) 533-2301	
58	Hartwell, Judy	City of Fort Myers Fire Dept.	jhartwell@cityftmyers.com	(239) 321-7321	
59	Hawes, Karen	County Administration / County Manager	khawes@leegov.co.	(239) 533-2221	
60	Hayden, Kenneth	Community Association Manager	Ken@Hayden-Associates.com	(239) 489-4890	
61	Hayhurst, Patrick	Lee County School Dist.	PatrickJH@leeschools.net	(239) 337-8598	

Kyle Kary – Intern

	A	B	SIGN IN SHEET for 9/19/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
62	Henninger, Lance	Sanibel Emergency Management	emergency.management@mysanibel.com	(239) 472-3111	
63	Henningson, John - Boca Grand		jchningson@aol.com		
64	Higgins, Douglas	Lee County Public Safety	dhiggins@leegov.com	(239) 533-3916	
65	Higginbotham, Tom	Fort Myers Fire Department	thigginbotham@cityftmyers.com		
66	Hunter, Arleon	City of Bonita Springs	arleen.hunter@cityofbonitasprings.org		
67	Ink, James				
68	Jackson, Tricia	Lee County Budget Services	tjackson@leegov.com	(239) 533-2309	
69	Jacoby, Billie	Community Development	Bjacoby@leegov.com	(239) 533-8948	Billie Jacoby
70	Jerant, Andy	American Red Cross	andy.jerant@redcross.org		
71	Jordan, James	City of Sanibel	jimmy.jordan@mysanibel.com	(239) 472-4136	
72	Kazemi, Saeed	City of Ft. Myers	skazemi@cityftmyers.com	(239) 321-7215	
73	Keyes, Pam	Lee County Utilities	Pkeyes@leegov.com	(239) 533-8544	
74	Kinsey, Philip	Bonita Fire	Kinsey@bonitafire.org		
75	Kirton, Kim	Public Resources / Administrative Specialist	kkirton@leegov.com	(239) 533-2107	
76	Klein, Bonnie	Facilities Construction & Management Life Safety	bklein@leegov.com	(239) 707-5668	
77	Kreiger, Lisa	Natural Resources / Operations Manager	LKreiger@leegov.com	(239) 533-8706	
78	Kreuz, Jeanette	Fort Myers Police Department	jkreuz@fmpolice.com	(239) 321-7759	
79	LaGuardia, Joan	Lee County Community Development	jlaguardia@leegov.com	(239) 533-8705	Joan LaGuardia
80	LaMontagne, Timothy	Solid Waste / Solid Waste Coordinator	tlamontagne@leegov.com	(239) 533-8960	
81	Larsen, Sandy	City of Sanibel	sandy.larsen@mysanibel.com	(239) 472-6397	Sandy Larsen
82	Lassiter, Trish	LCEC	Trish.Lassiter@lcec.net	(239) 292-3143	Trish Lassiter
83	Le-Blanc-Hutchings, Lisa	Lee County Port Authority	lleblanc-hutchings@flylcpa.com	(239) 590-4852	
84	Liggins, Mike		MLiggins@bsu.us		
85	Love, Jim	Lee County Health Department	James.Love@flhealth.gov	(239) 690-2103	
86	Lovejoy, Donna	City of Fort Myers	dlovejoy@cityftmyers.com	(239) 321-7217	
87	Loveland, David	Lee County Dept. of Transportation	Loveladm@leegov.com	(239) 478-8509	
88	Lucia, Scott Captain	Lee County Sheriff's Dept.	SLucia@Sheriffleefl.org	(239) 477-1066	
89	Mallow, Terry	Lee Clerk of Courts	tmallow@leeclerk.org	(239) 533-2184	
90	Manzo, Barbara	Lee County Parks & Recreation	Barbara@leegov.com	(239) 533-7412	
91	Marichal, Terry	Public Safety / Administrative Specialist	cmarichal@leegov.com	(239) 533-3964	
92	Margolis, Senator Gwen		margolis.gwen.web@flsenate.gov		
93	Mayfield, Lee	Lee County Emergency Mgmt	Lmayfield@leegov.com	(239) 533-0620	

	A	B	SIGN IN SHEET for 9/19/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
94	Mazurkiewicz, Heather	Lee Building Industry Assoc.	Heather@bia.net	(239) 936-5525	
95	Mercado, Roger	Lee County Human Services	rmercado@leegov.com	(239) 533-7930	
96	McGee, Jim	Lee County Historic Preservation Board	jmdgee@otc1.com	(239) 671-6287	
97	McIntyre, Ed	Lee County Parks & Recreation	Mcintyee@leegov.com	(239) 690-0554	
98	Miller, Rita	Lee Clerk of Courts	rmiller@leeclerk.org		
99	Moore, Steven Chief		scmoore@fgcu.edu		
100	Murphy, Gerald	Murphy Planning	jerry@murphyplanning .com	(239) 322-8510	
101	Myers, Steve	Lee County Transit	Slmyers@leegov.com	(239) 277-5012	
102	Nelson, Stanley		snelson@sheriffleefl.org		
103	Nesbit, Chief Larry	Bayshore Fire & Rescue	Chief@bayshorefire.org	(239) 543-3443	
104	Noble, Matthew	DCD Planning / Principal Planner	mnoble@leegov.com	(239) 533-8548	
105	Norvell, Jeremy	Lee County DOT	jnorvell@leegov.com	(239) 533-8400	
106	Ottolini, Roland	Natural Resources / Division Director	rottolini@leegov.com	(239) 533-8127	
107	Pigott, Tamara	Visitors and Convention	tpigott@leegov.com	(239) 533-6715	
108	Porter, Gary	Manager	gporter@leegov.com	(239) 498-0157	
109	Pringle, Bonnie		Bonniegiwa@comcast.net		
110	Quimby, Debbie	Lee County Emergency Management	dquimby@leegov.com	(239) 533-3640	Debbie Quimby
111	Richardson		urichardson@ralaw.com		
112	Richter, Garrett Senator		richter.garrett.web@flsenate.gov		
113	Ringle, Rachel	Cape Coral Emergency Management	ringle@capecoral.net	(239) 242-3635	
114	Rodgers, Michelle	Lee County Emergency Management	mrodgers@leegov.com	(239) 533-0605	
115	Rodriguez, Alberto Dr	Lee County School District	AlbertoR@leeschools.net	(239) 337-8106	
116	Rooker, Kathleen	Captiva Erosion District	mycepd8@gmail.com	239-472-2472	Kathleen Rooker
117	Sampson, Lindsey	Lee County Solid Waste	sampsolj@leegov.com	(239) 338-3302	
118	Schwing, Carl	City of Bonita Springs	carl.schwing@cityofbonitasprings.org		
119	Scott, Denise	Lee County Website Coordinator Content	dscott@leegov.com	(239) 533-2306	
120	Seeley, Ellen	City of Cape Coral Fire Dept.	eseeley@capecoral.net	(239) 573-3022	
121	Simmons, Clay	Lee County DOT	wsimmons@leegov.com	(239) 533-8803	
122	Smith, Holly	Private Citizen of Sanible	boatclub411@gmail.com	(239) 707-0800	
123	Solich, John	Lee County DOT Operations	jsolich@leegov.com	(239) 533-8400	
124	Southall, Robert	Lee County Transit	rsouthall@leegov.com	(239) 533-0363	
125	Spearo, Jesse	Cape Coral Emergency Management	jspearo@capecoral.net	(239) 242-3611	

	A	B	SIGN IN SHEET for 9/19/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
126	Stead, Ken		ken@swfmia.com		
127	Stelmacki, Sonny	Lee County School Dist.	Sonnyas@leeschools.net		
128	Stewart, Bob	Lee County Building Services	Rstewart@leegov.com	(239) 533-8320	
129	Tapfumaneyi, Sandra	Lee County Emergency Mgmt	stapfumaneyi@leegov.com	(239) 533-0614	
130	Tomlinson, Bill	City of Sanibel Police Dept.	Bill.tomlinson@ci.sanibel.fl.us	(239) 472-3111	
131	Trescott, Dan	SW FL Regional Planning Council	DTrescott@swfrpc.org	(239) 338-2550 x220	
132	Vance, Audrey	City of Bonita Springs	audrey.vance@cityofbonitasprings.org		
133	Vidal, Denis	LCEC	denise.vidal@lcec.net		
134	Wade, Doug	Lee Memorial	dwade@leememorial.org		
135	Weis, Dan	Construction and Design	dweis@leegov.com	(239) 707-6719	
136	Walker, Tim	SWFL Regional Planning Council	twalker@swfrpc.org	(239) 338-2550	
137	Wheaton, Patti	Medical Examiners Office, Lee County	Pwheaton@leegov.com	(239) 277-5020	
138	Will, Megan	Town of Fort Myers Beach	Megan@FortMyersBeachFL.gov	(239) 765-0202	
139	Wilson, Hans	SW FL Marine Industries Association	hans@hanswilson.com	(239) 656-7083	
	Beals, Nathan	Lee County Utilities	nbeals@leegov.com	239-533-8157	
	Thompson, Richard	City of Fort Myers	rthompson@cityfortmyers.com	239-321-7130	
	Massey, David	Lee county EOC			
	Coleman, KYCE	VILLAGE OF ESTERO	COLEMAN@ESTERO-FL.GOV	239-221-5035	
	Smith, Steven	ARES/RACES	W9GPI@ME.com	920-251-6249	
	Delty, Wyatt	City of Cape Coral	wdalty@capecoral.net	239-573-3160	

Meeting Minutes

DISASTER ADVISORY COUNCIL LMS WORKING GROUP MEETING
September 19, 2016

Baucom, Warren – Lee County Economic Development
Beals, Nathan - Lee County Utilities
Brown, Pam - Visitors Convention Bureau
Campbell, Gerald – Florida Gulf Coast University
Carter, Cindy – Lee County Parks & Recreation
Carter, Linda – No Person Left Behind
Cassidy, Frank – City of Bonita Springs
Coleman, Kyle – Village of Estero
Dalton, William – Sanibel Police Department
Daltry, Wyatt – City of Cape Coral
Davis, Jenny - Lee County Public Safety
Dunn, Brandon - Lee County Community Development
Eck, Caitlyn – Lee County Health Department
Fenske, Jennifer – Lee County Public Safety
Fournier, Celeste - Lee County Emergency Management
Gooderham, Kate - Gooderham & Associates
Hartwell, Judy – City of Fort Myers Fire Dept.
Jacoby, Billie – Lee County Community Development
LaGuardia, Joan – Lee County Community Development
Larsen, Sandy – City of Sanibel
Lassiter, Trish - LCEC
Massey, David – Intern Lee County Management
Mayfield, Lee - Lee County Emergency Management
Quimby, Debbie - Lee County Emergency Management
Rooker, Kathleen – Captiva Erosion District
Smith, Stephen – ARES/RACES
Spearo, Jesse – Cape Coral Emergency Management
Thompson, Richard – City of Fort Myers
Walker, Tim – SWFL Regional Planning Council
Will, Megan – Town of Fort Myers Beach

Agenda Items

- Welcome and Introductions
- Update on LMS/Next Steps
  Working with County Departments (Community Development, Natural Resources-Need to get with DOT, FFS, Utilities, SFWMD and a few others to include special districts)
- Update from Captiva Erosion Prevention District
- Shelter Projects
- Update on Project List from Municipalities:
  - Bonita Springs
  - Cape Coral
  - Estero
  - Fort Myers
  - Fort Myers Beach
  - Sanibel
- Open Comment/Discussion
- Next Meeting/Next Steps
- Adjourn

Lee Mayfield, Emergency Planning Manager opened the meeting at 2:05 pm on 9/19/16.

Minute Approval

Motion to approve meeting minutes from 8/22/16 made by William Dalton, Seconded by Cindy Carter. All in favor.

Welcome and Introduction - Lee Mayfield

I think we lost a few to the rally going on at Germain, but I appreciate you all coming to talk mitigation today. These meetings are a formal part of our Disaster Advisory Council for the county, and we are getting a lot of those suggestions out to our program and focusing on the Local Mitigation Strategy. We have the sign in sheets in the back and it's important that your attendance is documented.

Update on LMS Process - Lee Mayfield

We went out to bid to get some support and develop this Local Mitigation Strategy. We are in the contract, negotiating discussion process. We had a good bid meeting with County Procurement and they walked us through the process and we have 5 people that have made bids. Hopefully, we are pretty confident that by the next meeting we should have that vendor here or on the phone with us to start getting into turning out portion of this plan updates. Last couple of weeks some of you have received emails from me and starting to have some initial sit downs with more departments and jurisdictions to talk in to detail about the plans or references that I don't know about. When you get an email or call to sit down with me to talk this is just my diligence and we will get the vendor to assist with this process when we update the plan. If you have a portion of the plan and you see things that will affect your agency, city, or department let us know and we will make an effort to update it. Still a few departments I need to speak with; Lee County DOT, Florida Forestry Service, Wildfire Mitigation piece of the plan, Utilities, Southwest Florida Management District. Over the next weeks and months I will be sitting down with some of you for more detailed information to go through and start making the changes in the plan. As we do this in the next meeting we will talk about the changes we make and the updates and throughout the process we will get draft plans written we will present those to the group. It will give you all time to read over and make any comments or any edits. We probably will post all those edits in the drafts on our website to make sure the public can maintain contact and send us an email if anything needs to be proposed in this plan.

Update from Captiva Erosion Prevention District – Kathy Rooker

I'm Kathy Rooker – Administrator for the Captiva Erosion Prevention District. We are a government entity on Captiva and our responsibilities include all the coaster areas of Captiva Island; from mid at Blind Pass all the way to mid-point at Redfish Pass. We are responsible for validating erosion control projects. We have done 4 island wide nourishment projects on Captiva dating back to 1988. Last time was done in 2013-2014 it was a 19 ½ million dollar project. I have been with them for 8 years, and in addition to serving as Administrator I also, serve on the Lee County Parks and Recreation Advisory Board, I serve on the Hope Advisory Council for Lee County and Hurricane Preparedness Committee for the Island of Captiva.

Update on Project Lists from Municipalities - Lee Mayfield

If and when we propose projects we will have to have the formal process, writing the initiatives and bringing them back for discussion. It will be good to hear some of the projects ideas and maybe the next meeting in October we will have some of those longer discussions on those projects that you want to bring forward. Again, if you want to remove a project you will need just say remove it and list the reason why it's completed or no longer a priority. You will just need a one sentence explanation why some of the old projects should be taken off the list. One of the examples we have some shelter projects that were on the listing, wind retrofit for Harborside Complex, Broadway Palm Theater hurricane shelter retrofit, Edison Community College hurricane shelter retrofit, and North Shore Alliance Church of North Fort Myers hurricane shelter retrofit. From our prospective in Emergency Management we are the lead for sheltering operations and we would probably not use those for shelters and remove them from the project list, but not before we talk about it first. These projects start to tie together between different jurisdictions, so before we remove something we want to do the best we can at making sure we are doing the right thing since it could be important for someone else. We will work off online and talk formally about this and then bring up at a future meeting.

Cape Coral – We are in the process of reviewing the list that we currently have projects on. Most of them are going to be purged
and we will be adding new projects. We have about a half dozen or so that we will probably develop the application for and will submit that by the next turn for this review. We also, met with Chief Vanderbrook a couple weeks ago to talk about some of these things and we would be more than happy to help them out as well.

Estero – We don't have much to add Chief Vanderbrook is pretty busy with the truck. Lee - I know you guys are new to this process. I talked with the Chief about him being involved from the fire district perspective, and we are glad you guys are here and officially from the Village to show your involvement.

Fort Myers – Next week I'm going to try and contact you so we can discuss and go over. Most of what I've came up with is infrastructure needs, a couple redesigns, and some culvers that need maintained and repaired.

Fort Myers Beach – We did our facilities master plan and we have it broken into 5 or 6 projects. Do we need to do the analysis?
Lee – I need to get you guy's better guidance on that question and put it in writing. Not hard to get these projects on the
list they just want you to have something in the works. Most things are pretty straight forward and you will see it's a lot subjective community exposure, and community benefit. The only one you don't score when you go through this is the level of public demand. This is the one that we will discuss together and vote on a score.

Sanibel – 4 Utility projects: Natural Resource one is called a living shoreline project it's a three locations on the island and expected to be a 1 to 3 year project and our Natural Resource would supervise that one. We are going to replace the exterior doors at City Hall, so they meet the current wind and impact rating. (about $50,000) One to two years Public Works will supervise. Replace windows in the Public Works building, so they meet the current wind and impact ratings. (about $15,000) One to two years Public Works will manage. Project to build an elevated and covered storage building that would house all the emergency generators we have. (about $50,000) Public Works would do this. If the power goes out city wide one of the main things we have to do is bring generators around to all the lift stations. The sewer system does not work without power and important to get those generators to the lift stations. Elevated and covered storage garage to house the heavy equipment and supplies for an emergency. (about $300.000) One year and Public Works will supervise it. Lee – Those are good examples. One question that came up a few weeks ago was that after a disaster we get a lot of public assistance funding; what is the difference between that public assistance

funding versus the hazard mitigation funding? Still working on getting a good answer for that & when I do I will send out when I get. You don't want to put something on there if it's already funded through someplace else. When you go through the updates there is a whole section on how you maintain this plan and this is something we will try and stick to a little bit more through these meetings.

Open Comments / Discussion

Lee Mayfield – There are county departments I have not briefed on the county stuff yet because I'm still working with meeting with some of the department's one on one. There are a lot of Utility projects and DOT projects from the Lee County side. Some of them kind of string into the other jurisdictions as well, so we will have to work together on that process. Are there any other jurisdictions that have projects on the list that want to talk about those projects or any questions?

Cindy Carter / Lee County Parks & Recreation – In your discussion with DOT has anyone mentioned the project for Sanibel Causeway and the erosion project? Lee – Not yet. There have been some discussions not related to this process. It may be a good opportunity to put this on the list. The DOT property extends so far out and then it's Parks & Recreation and what's happening is the water erosion which could affect the roadway to and from Sanibel and that's something I would like to look at.
Lee – Have you guys talked about putting some of those ideas in this process? William Dalton - The tricky part of the Sanibel Causeway is it should be named the Lee County Causeway; everyone thinks we own it but we don't. We do have an area of concern that is not necessary the erosion on the causeway, but where the roadway comes down off of the highest band. We get a lot of water over that section, so we are going to ask to look and try and figure that out. The erosion would be a problem also, so anything that would make the causeway more secure and passable we would certainly be in favor of. In this process here we can't ask for two projects out of our jurisdiction, sort of speak its Lee County's jurisdiction. It's kind of been a sticky point on a number of issues. Cindy Carter - That's kind of why I mentioned it. I will work with Lee and get all the information I can and try and go from there. Lee – Good point made. I emailed DOT and they are looking at those projects on their end. You can see how some of these projects reach out and touch multiple departments and jurisdictions and this is a perfect example.
Kate Gooderham / Gooderham & Associates – One of the things that people who are new to this process might benefit from knowing is that another value to getting on the list is you can brag you were on the list for any circumstance, so it may help you get grants or some other funding. The Rockefeller Foundation is giving out grants for resilient cities in Cape Coral.
Tim Walker / SWFL Regional Planning Council – This is regards to shelter and may be a potential project. Having dealt with shelters throughout my region and Lee County included it seems that pet friendly shelters are kind of rare. What are the criteria for having a shelter to be pet friendly & if anything can be done to make it increase the availability to make people go there and take the burden off of other places? Maybe pet care? Lee – Historically, the mitigation projects on this list have been more structurally based, but that's a good question & I'll ask that. Can we put projects on the list that would allow us if we got funding to build out our capability in a certain way.
Debbie Quimby / Lee County Emergency Management – This year Sandi Bridges was able to work with Animal Services and they are allowing Special Needs Shelter to bring their pets for the first time this year. They went last week to identify areas for the cats and dogs to be housed in the shelter and Animal Services was very pleased with the areas they found. Although, I'm sure the first time we open that shelter we will find some interesting things. So far looks like our plans are going pretty well. The Special Needs Shelter is at Ray Pottorf Elementary.
Jesse Spero / Cape Coral Emergency Management – Earlier this year we had planned to do a G-393 Mitigation Emergency Management class, but it was cancelled because we didn't have enough attendance. I would be interested in teaching this again if there is any interest. (1 ½ day class) Celeste Fournier – It's been on the schedule for 2 years now and it's had to be cancelled because no one signs up for it. Would be happy to list it if you can come up with 15 willing participates.
This would be a good class for people in the room. The class talks about public assistance, mitigation grants criteria, process at the Federal level, local level mitigation initiatives, practice to get funded down the

road. Jesse – Have you talked or considered pursuing a C Grant or any other grants that are out there for sea level rise or coastal impacts? Lee – Once our vendor gets on board we will have this discussion with them.

Linda Carter / No Person Left Behind – Just got back from working with FEMA in Charleston, West Virginia. One of the issues we had with major flooding was outlying roads where people couldn't get help and assistance. Looking at this from our point of view with our canals & waterways and when flooding starts and we can't get fire trucks or ambulances through. We need to start looking at some of those areas beforehand, so that they don't become an emergency and put people at risk. That would fall under mitigation I believe looking beforehand. Also, ran into a lot of people not knowing what a Go Kit or a Ready Kit was for evacuation. It was especially a concern if they had medical problems or conditions. Lee – I think so, a lot of the DOT projects may be related to this. Our Natural Resources folks do some of that planning too.

Pam Brown / Visitors Convention Bureau – First week Island Hopper Songwriter Fest starts this weekend, Captiva next week and then downtown Fort Myers. Parmalee will be playing if anyone is up on their country music. The following weekend will be Fort Myers Beach. Everyone go and have fun! Parking is a pill, but enjoy.

Lee Mayfield – We did not advertise this meeting to much, but we are having an initial get together with some private sector partners on Wednesday at 2:30 here, so if you'd like to attend there will be an initial discussion about the involvement of the private sector and disaster response.

Next Meeting / Next Steps - Lee Mayfield

The next meeting will be held October 19, 2016.

Adjourn

Motion to adjourn made by Linda Carter, Seconded by William Dalton. Meeting adjourned at 2:45 PM

November 1, 2016

Public Notice

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PUBLIC NOTICE

County's Local Mitigation Strategy Update

PLEASE BE ADVISED that Lee County Emergency Management will hold a public meeting where concerns and comments will be heard in order to update the County's Local Mitigation Strategy. The meeting will be held on Tuesday, November 1st, 2016 at 2:30pm at the Lee County Emergency Operations Center (2675 Ortiz Ave, Fort Myers, FL 33905).

The Local Mitigation Strategy (LMS) establishes a plan to make the County safer from a variety of hazards and to reduce long term deaths and property damage. Federal rules require that local governments maintain a Local Mitigation Strategy to receive several types of disaster related assistance grants. Public comment is a federal requirement for plan approval.

Lee County Emergency Management encourages the public to view the draft version of the plan at the website: https://www.leegov.com/publicsafety/emergencymanagement/plan/mitigation

Comments on the plan can be directed to: Lee Mayfield, Lee County Public Safety/Emergency Management, 239-533-0622, lmayfield@leegov.com.

Public input in the development of the Local Mitigation Strategy will ensure that the money is spent on mitigation projects that benefit the community most. Lee County Emergency Management needs help in identifying places that are at risk to natural hazards and projects that could be carried out to mitigate the hazards. Hazard mitigation actions include: prevention, property protection, public education, natural resource protection, emergency services protection and structural projects. Lee County Emergency Management is looking for mitigation project ideas.

If you have a disability that will require special assistance or accommodations for your attendance at the public hearing, please call Lee County Administration at 239-533-2221 for information.
PO WESTEN: L102416-15
AD#1677922 10/24/16

Sign-In Sheet

	A	B	SIGN IN SHEET for 11/1/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
3	Abes, Ben	Lee County Public Safety	benjamin.abes@leegov.com	(239) 533-3961	
4	Ahmadi, Kevin		kevina@gulfcoastvillage.org		
5	Barden, Jack	Equal Opportunity Analyst	jbarden@leegov.com	(239) 533-2201	
6	Baucom, Warren	Lee County Economic Development	wbaucom@leegov.com	(239) 338-3161	
7	Beals, Nathan	Lee County Utilities	nbeals@leegov.com	(239) 533-8157	
8	Beck, Richard	Lee County Public Works Dept.	Rbeck@leegov.com	(239) 533-8822	
9	Benacquisto, Senator Lizbeth		benacquisto.lizbeth.web@flsenate.gov		
10	Bjostad, James	Lee County Emergency Mgmt	Jbjostad@leegov.com	(239) 533-0617	
11	Bowen, Trenton Chief	City of Fort Myers Fire Dept.	Tbowen@cityftmyers.com	(239) 321-7311	
12	Brady, Christine	Lee County Human Resources Director	cbrady@leegov.com	(239) 533-2348	
13	Bridges, Sandi	Lee County Emergency Mgmt	sbridges@leegov.com	(239) 533-0615	
14	Brown, Pam	Visitors Bureau / Conference & Event Manager	pbrown@leegov.com	(239) 338-3500	
15	Cain, John	American Red Cross	disaster@arclee.org	(239) 278-3401	
16	Campbell, Chris	City of Bonita Springs	Christopher.Campbell@cityofbonitasprings.org		
17	Campbell, Gerald	Emergency Manager - FGCU	gcampbell@fgcu.edu	(239) 590-1948	
18	Carter, Cindy	Lee County Parks & Recreation	ccarter@gmail.com	(239) 229-0493	
19	Carter, Linda	No Person Left Behind	mslindacarter@gmail.com	(239) 368-6846	
20	Cassidy, Frank	City of Bonita Springs	frank.cassidy@cityof bonitasprings.org	(239) 949-6257	
21	Cloutier, Peter	Internal Services / Mgr. Internal Serv. - Fiscal	pcloutier@leegov.com	(239) 533-8512	
22	Cochran, Don Chief	City of Cape Coral Fire Department	dcochran@capecoral.net		
23	Coleman, Kyle	Village of Estero	coleman@estero-fl.gov	(239) 221-5035	
24	Crawford, David		dcrawford@swfrpc.org		
25	Crisafulli, Susan	LCEC	susan.crisafulli@lcec.net	(239) 656-2399	
26	Dalton, Lt. William	Sanibel Police Department	bill.dalton@mysanibel.com	(239) 472-3111	
27	Daltry, Wyatt	City of Cape Coral	wdaltry@capecoral.net	(239) 573-3160	
28	Danner, Lisa	Hagerty Consulting	lisa.danner@hagertyconsulting.com	(423) 727-9058	
29	Davis, Jenny	Public Safety / Administrative Specialist	jldavis@leegov.com	(239) 533-3948	
30	Deerey, Aaron	Lee County Port Authority	amdeerey@flylcpa.com	(239) 590-4696	
31	Delrose, L	City of Fort Myers	ldelrose@cityftmyers.com		
32	Dobson, Kenny	School District of Lee County	KennethDD@leeschools.net	(239)0839-9083	
33	Doggett, Linda	Lee Clerk of Courts	ldoggett@leeclerk.org	(239) 533-2554	

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	A	B	SIGN IN SHEET for 11/1/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
34	Donley, Liz	Charlotte Harbor National Estuary Program	ldonley@chnep.org		
35	Drake, Dylan	Lee County Human Resources	Draked@leegov.com	(239) 533-2005	
36	Duncan, Danny	Sanibel Fire	Danny@sanibelfire.com		
37	Duncan, Gary E.	Lee County Port Authority	GEDuncan@flylcpa.com	(239) 590-4721	
38	Dunn, Brandon	Lee County Community Development	bdunn@leegov.com	(239) 533-8809	
39	Eck, Caitlyn	Lee County Health Department	Caitlyn.Eck@flhealth.gov	(239) 461-6128	
40	Eckert, Timothy	Parks & Recreation	teckert@leegov.com	(239) 432-2076	
41	**Farmer, Rob - DAC Chair**	Lee County Public Safety Director	rfarmer@leegov.com	(239) 533-3911	
42	Fenske, Jennifer	Lee County Public Safety	jfenske@leegov.com	(239) 533-3922	
43	Flanjack, Alise	Lee County Parks & Recreation	afanjack@leegov.com	(239) 533-7451	
44	Floyd, William	Lee County Emergency Mgmt	wfloyd@leegov.com	(239) 533-0611	
45	Fournier, Celeste	Lee County Emergency Mgmt	cfournier@leegov.com	(239) 533-0694	
46	Fournier, Jason	Lee County Solid Waste	JFournier@leegov.com	(239) 338-3302	
47	Frantz, Joe	Lee County DOT Operations	frantzja@leegov.com	(239) 533-9400	
48	Fraser, Andrea	Lee County Attorney	afraser@leegov.com	(239) 533-2236	
49	Gabrick, Eileen	Lee Clerk of Courts	egabrick@leeclerk.org	(239) 533-2124	
50	Gibbons, John	Southwest Florida Regional Planning Council	Jgibbons@SWFRPC.org	(239) 338-2550	
51	**Gooderham, Kate - Vice Chair**	Gooderham & Associates	kgooderham@comcast.net	(239) 489-2616	
52	Goyette, Paul	Lee County Lee Tran	pgoyette@leegov.com	(239) 533-0343	
53	Grant, Damon	Lee County Construction & Design	dgrant2@leegov.com	(239) 281-9086	
54	Grigsby, Melanie R	City of Ft. Myers	Mgrigsby@cityftmyers.com	(239) 321-7467	
55	Guirguis, Ehab	Lee County DOT Operations	eguiguis@leegov.com	(239) 533-9400	
56	Gulamali, Al	Lee County Port Authority	AnGulamali@flylcpa	(239) 590-4720	
57	Hamilton, Rebecca	Examiner	rhamilton@leegov.com	(239) 277-5020	
58	Hanna, Rebecca	Public Safety / Office Manager	rhanna@leegov.com	(239) 533-3973	
59	Harner, David	Parks and Recreation / Director	dharner@leegov.com	(239) 533-7408	
60	Harris, David	Budget Services / Manager, Budget Services	dharris@leegov.com	(239) 533-2301	
61	Hartwell, Judy	City of Fort Myers Fire Dept.	jhartwell@cityftmyers.com	(239) 321-7321	
62	Hayden, Kenneth	Community Association Manager	Ken@Hayden-Associates.com	(239) 489-4890	

2

	A	B	SIGN IN SHEET for 11[th]1/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
63	Hayhurst, Patrick	Lee County School Dist.	PatrickJH@leeschools.net	(239) 337-8598	
64	Henninger, Lance	Sanibel Emergency Management	emergency.management@mysanibel.com	(239) 472-3111	
65	Henningson, John - Boca Grand		jchningson@aol.com		
66	Higgins, Douglas	Lee County Public Safety	dhiggins@leegov.com	(239) 533-3916	
67	Higginbotham, Tom	Fort Myers Fire Department	thigginbotham@cityftmyers.com		
68	Hunter, Arleen	City of Bonita Springs	arleen.hunter@cityofbonitasprings.org		
69	Ink, James				
70	Jackson, Tricia	Lee County Budget Services	tjackson@leegov.com	(239) 533-2309	
71	Jacoby, Billie	Community Development	Bjacoby@leegov.com	(239) 533-8948	Billie Jacoby
72	Jerant, Andy	American Red Cross	andy.jerant@redcross.org		
73	Jordan, James	City of Sanibel	jimmy.jordan@mysanibel.com	(239) 472-4136	
74	Kazemi, Saeed	City of Ft. Myers	skazemi@cityftmyers.com	(239) 321-7215	
75	Keyes, Pam	Lee County Utilities	Pkeyes@leegov.com	(239) 533-8544	
76	Kinsey, Philip	Bonita Fire	Kinsey@bonitafire.org		
77	Kirton, Kim	Public Resources / Administrative Specialist	kkirton@leegov.com	(239) 533-2107	
78	Klein, Bonnie	Facilities Construction & Management Life Safety	bklein@leegov.com	(239) 707-5668	
79	Kreiger, Lisa	Natural Resources / Operations Manager	LKreiger@leegov.com	(239) 533-8706	
80	Kreuz, Jeanette	Fort Myers Police Department	jkreuz@fmpolice.com	(239) 321-7759	
81	LaGuardia, Joan	Lee County Community Development	jlaguardia@leegov.com	(239) 533-8705	
82	LaMontagne, Timothy	Solid Waste / Solid Waste Coordinator	tlamontagne@leegov.com	(239) 533-8960	
83	Larsen, Sandy	City of Sanibel	sandy.larsen@mysanibel.com	(239) 472-6397	Sandy Larsen
84	Lassiter, Trish	LCEC	Trish.Lassiter@lcec.net	(239) 292-3143	
85	Le-Blanc-Hutchings, Lisa	Lee County Port Authority	llleblanc-hutchings@flylcpa.com	(239) 590-4852	B Hutchings
86	Liggins, Mike		MLiggins@bsu.us		
87	Love, Jim	Lee County Health Department	James.Love@flhealth.gov	(239) 690-2103	
88	Lovejoy, Donna	City of Fort Myers	dlovejoy@cityftmyers.com	(239) 321-7217	
89	Loveland, David	Lee County Dept. of Transportation	Loveladm@leegov.com	(239) 478-8509	
90	Lucia, Scott Captain	Lee County Sheriff's Dept.	SLucia@Sheriffleefl.org	(239) 477-1086	
91	Mallow, Terry	Lee Clerk of Courts	tmallow@leeclerk.org	(239) 533-2184	
92	Manzo, Barbara	Lee County Parks & Recreation	Barbara@leegov.com	(239) 533-7412	
93	Marichal, Terry	Public Safety / Administrative Specialist	cmarichal@leegov.com	(239) 533-3964	
94	Margolis, Senator Gwen		margolis.gwen.web@flsenate.gov		

Check Email Sandy.larsen@mysanibel.com

3

	A	B	SIGN IN SHEET for 11[th]1/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
95	Massey, David	Lee County Emergency Mgmt			
96	Mayfield, Lee	Lee County Emergency Mgmt	Lmayfield@leegov.com	(239) 533-0620	
97	Mazurkiewicz, Heather	Lee Building Industry Assoc.	Heather@bia.net	(239) 936-5525	
98	Mercado, Roger	Lee County Human Services	rmercado@leegov.com	(239) 533-7930	
99	McGee, Jim	Lee County Historic Preservation Board	jmdgee@otc1.com	(239) 671-6267	
100	McIntyre, Ed	Lee County Parks & Recreation	Mcintyee@leegov.com	(239) 590-0554	
101	Miller, Rita	Lee Clerk of Courts	rmiller@leeclerk.org		
102	Moore, Steven Chief		scmoore@fgcu.edu		
103	Murphy, Gerald	Murphy Planning	jerry@murphyplanning .com	(239) 322-8510	
104	Myers, Steve	Lee County Transit	SImyers@leegov.com	(239) 277-5012	
105	Nadler, Kristi	Lee County Emergency Mgmt	knadler@leegov.com	(239) 533-0610	KS Nadler
106	Nelson, Stanley		snelson@sheriffleefl.org		
107	Nesbit, Chief Larry	Bayshore Fire & Rescue	Chief@bayshorefire.org	(239) 543-3443	
108	Noble, Matthew	DCD Planning / Principal Planner	mnoble@leegov.com	(239) 533-8548	
109	Norvell, Jeremy	Lee County DOT	jnorvell@leegov.com	(239) 533-9400	
110	Ottolini, Roland	Natural Resources / Division Director	rottolini@leegov.com	(239) 533-8127	
111	Parry, Gisele	Hagerty Consulting	gisele.parry@hagertyconsulting.com		
112	Pigott, Tamara	Visitors and Convention	tpigott@leegov.com	(239) 533-6715	
113	Porter, Gary	Manager	gporter@leegov.com	(239) 498-0157	
114	Pringle, Bonnie		Bonniegiwa@comcast.net		
115	Quimby, Debbie	Lee County Emergency Management	dquimby@leegov.com	(239) 533-3640	
116	Richardson		urichardson@ralaw.com		
117	Richter, Garrett Senator		richter.garrett.web@flsenate.gov		
118	Ringle, Rachel	Cape Coral Emergency Management	ringle@capecoral.net	(239) 242-3635	
119	Rodgers, Michelle	Lee County Emergency Management	mrodgers@leegov.com	(239) 533-0605	
120	Rodriguez, Alberto Dr	Lee County School District	AlbertoR@leeschools.net	(239) 337-8106	
121	Rooker, Kathleen	Captiva Erosion District	mycepd8@gmail.com		
122	Sampson, Lindsey	Lee County Solid Waste	sampsoli@leegov.com	(239) 338-3302	
123	Schwing, Carl	City of Bonita Springs	carl.schwing@cityofbonitasprings.org		
124	Scott, Denise	Lee County Website Coordinator Content	dscott@leegov.com	(239) 533-2306	
125	Seeley, Ellen	City of Cape Coral Fire Dept.	eseeley@capecoral.net	(239) 573-3022	
126	Simmons, Clay	Lee County DOT	wsimmons@leegov.com	(239) 533-8803	

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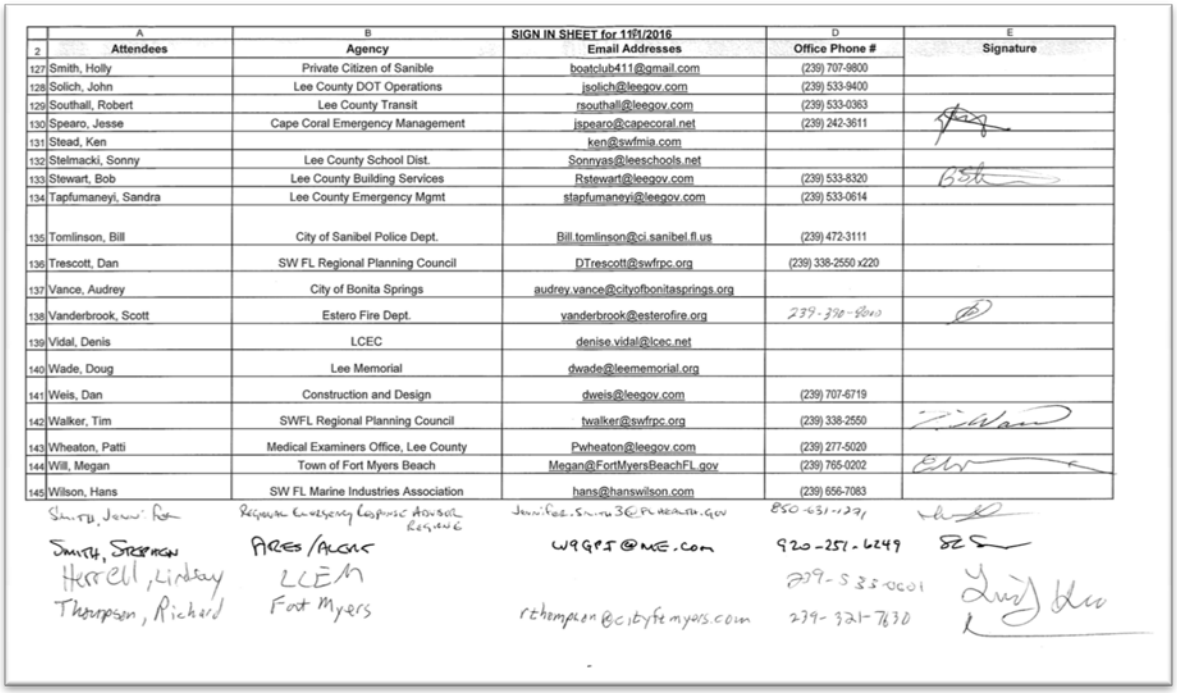

	A	B	SIGN IN SHEET for 11/1/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
127	Smith, Holly	Private Citizen of Sanible	boatclub411@gmail.com	(239) 707-9800	
128	Solich, John	Lee County DOT Operations	jsolich@leegov.com	(239) 533-9400	
129	Southall, Robert	Lee County Transit	rsouthall@leegov.com	(239) 533-0363	
130	Spearo, Jesse	Cape Coral Emergency Management	jspearo@capecoral.net	(239) 242-3611	
131	Stead, Ken		ken@swfmia.com		
132	Stelmacki, Sonny	Lee County School Dist.	Sonnyas@leeschools.net		
133	Stewart, Bob	Lee County Building Services	Rstewart@leegov.com	(239) 533-8320	
134	Tapfumaneyi, Sandra	Lee County Emergency Mgmt	stapfumaneyi@leegov.com	(239) 533-0614	
135	Tomlinson, Bill	City of Sanibel Police Dept.	Bill.tomlinson@ci.sanibel.fl.us	(239) 472-3111	
136	Trescott, Dan	SW FL Regional Planning Council	DTrescott@swfrpc.org	(239) 338-2550 x220	
137	Vance, Audrey	City of Bonita Springs	audrey.vance@cityofbonitasprings.org		
138	Vanderbrook, Scott	Estero Fire Dept.	vanderbrook@esterofire.org	239-390-9013	
139	Vidal, Denis	LCEC	denise.vidal@lcec.net		
140	Wade, Doug	Lee Memorial	dwade@leememorial.org		
141	Weis, Dan	Construction and Design	dweis@leegov.com	(239) 707-6719	
142	Walker, Tim	SWFL Regional Planning Council	twalker@swfrpc.org	(239) 338-2550	
143	Wheaton, Patti	Medical Examiners Office, Lee County	Pwheaton@leegov.com	(239) 277-5020	
144	Will, Megan	Town of Fort Myers Beach	Megan@FortMyersBeachFL.gov	(239) 765-0202	
145	Wilson, Hans	SW FL Marine Industries Association	hans@hanswilson.com	(239) 656-7083	
	Smith, Jenni For	Regional Emergency Response Advisor Regions 6	Jennifer.Smith3@FLHEALTH.GOV	850-631-1791	
	Smith, Stephen	ARES/RACES	W9GFI@ME.com	920-251-6249	
	Herrell, Lindsay	LCEM		239-533-0001	
	Thompson, Richard	Fort Myers	rthompson@cityftmyers.com	239-321-7830	

Meeting Minutes

DISASTER ADVISORY COUNCIL LMS WORKING GROUP MEETING #1
November 1, 2016

Beals, Nathan - Lee County Utilities
Bridges, Sandi – Lee County Emergency Management
Campbell, Gerald – Florida Gulf Coast University
Carter, Cindy – Lee County Parks & Recreation
Cassidy, Frank – City of Bonita Springs
Dalton, William – Sanibel Police Department
Daltry, Wyatt – City of Cape Coral
Danner, Lisa – Hagerty Consulting
Davis, Jenny - Lee County Public Safety
Dunn, Brandon - Lee County Community Development
Eck, Caitlyn – Lee County Health Department
Fournier, Celeste - Lee County Emergency Management
Goyette, Paul – Lee County Lee Tran
Guirguis, Ehab – Lee County DOT
Herrell, Lindsay – Lee County Emergency Management
Higgins, Douglas – Lee County Public Safety
Jacoby, Billie – Lee County Community Development
Larsen, Sandy – City of Sanibel
Le-Blanc-Hutchings, Lisa – Lee County Port Authority
Mayfield, Lee - Lee County Emergency Management
Nadler, Kristi - Lee County Emergency Management
Parry, Gisele – Hagerty Consulting
Quimby, Debbie - Lee County Emergency Management
Rooker, Kathleen – Captiva Erosion District
Smith, Jennifer – Lee County Florida Health
Smith, Stephen – ARES/RACES
Spearo, Jesse – Cape Coral Emergency Management
Stewart, Bob – Lee County Building Services
Thompson, Richard – City of Fort Myers
Vanderbrook, Scott – Estero Fire Department
Walker, Tim – SWFL Regional Planning Council
Will, Megan – Town of Fort Myers Beach

Agenda Items

- Welcome and Introductions
- Project Introduction
    - Purpose and Benefits of Hazard Mitigation Planning
    - Lee County's Guiding Principles
    - Planning Process – Public Meetings
    - Review of Current LMS Goals
    - Review of Current Hazards
    - Project Timeline/Next Steps
- Questions
- Final Comments/Adjourn

Lee Mayfield, Emergency Planning Manager opened the meeting at 2:32 pm on 11/1/16.

Minute Approvals

Motion to approve meeting minutes from 7/20/16 & 9/19/16 made by William Dalton, Seconded by Frank Cassidy. All in favor.

Welcome and Introduction - Lee Mayfield

We have a very good vendor on board with us called Hagerty Consulting. I will turn it over to them and they will lead the majority of our discussion today to talk about the process. Some of this stuff we have touched on in previous meetings, but now we will get detailed on getting some comments from you all. If you don't have comments today on certain things that's okay, we will talk about the meeting schedule and how we can incorporate the feedback from everyone here.

Lisa Danner, I'm the Project Manager for this project and will be working with you to update your Local Mitigation Strategy. I started out as a local fire marshal management coordinator for 21 years in North Carolina and have been on the consulting side of the house for the past 11 years. Looking forward to working with you guys. I'm currently working in the state of Texas, state of Georgia in updating Local Mitigation Plans currently.

Gisele Parry, I'm the Project Lead on this project as well. I've been in Emergency Management for about 18 years and also, working with Lee County Region 6 on vaccination.

Ashley Wargo, is not here today but she will be doing a lot of outreach and if we need information you probably will get a call or email from her. We will have all of our contact information up as we go forward. We might not have a lot of questions get answered today, but we are going to put some food for thought out there. We will hit on the themes that we know are required to update the LMS and to get your information from 2010. You may leave here with some homework or for some food for thought. We will be talking about the project timeline and the schedule moving forward.

Purpose and Benefits of Hazard Mitigation Planning – Lisa Danner

We are going to talk about why we are doing ligation and why we are updating the plan. If you have any questions, please let me know. Some of this information may be repetitive since I know this working group is very active group in talking with Lee.

Ligation and having these plans FEMA does require them under the Disaster Mitigation Act of 2000. Future federal funding is needed and contingent on becoming eligible and approved under the plan. You must have a FEMA and State approved Hazard Mitigation Plan. Your funding is contingent on having the plan as well

as keeping it updated every 5 years. This is where you are right now in the 5 year cycle and it helps to guide post disaster recovery. One of the things in your plan currently is a lot of strategies or documents, so one of the things you have already done is working through what is the status of those strategies. What the status of those projects as relation to what you have in your plan of 2010. Have the strategies been completed or are you still working on them, is it something you need to eliminate. It helps to guide that post disaster recovery when money becomes available through mitigation whether it be through the pre disaster or disaster program; it helps us to guide that post disaster recovery. The involvement of most stake holders and public participation – one of the requirements from FEMA is that the public be invited to participate as well across the board stake holders. You currently have hazards in your current strategies so we will look at the status of those hazards. Are they still ranked where they need to be or has something changed, or need to be added? It's usually broken out into natural and either man made or technological hazards. FEMA only looks at your natural hazards but in talking with Lee there may be some changes or additions that we want to add to. Both the natural and technological man-made side, so we take a look at those hazards and the risks and the vulnerability for each of those hazards in the plan. Builds support for mitigation activities your strategies and projects help to educate community officials and the public. It may even develop more effective policies whether it be land use, building code CRS program, flood plain management or whatever the case maybe. It helps to have a more effective policy and policies put into place for the county as a whole. What you want to do is lessen, reduce or eliminate any of these risks or hazards that may impact Lee County. It reduces the vulnerability of those future hazards, can save lives and properties whether it's moving conflicts. Some of your average strategies or projects in the past have been either evaluated structure or moving structure completely out of arms way. Facilitates pre and post disaster funding speeds recovery and anything you can do to maintain that economic stability for the county everybody wins. There are some grant programs out there Hazard Mitigation Grant program that provides grants to implement hazard mitigation measures following a disaster. So if a disaster occurs a percentage of money is made available and you can apply for this disaster grant if you already have strategies in place. This is just pulling these strategies out of your plan and plugging them into the hazard mitigation grant application. You would submit and then be eligible for funding or receiving when an event occurs. They are non competitive and look at projects across the board, they look at your plan; anything you can do planning wise before is going to put you ahead of the game. You can also, fund for non planning projects through the program but you have to have the approved federally approved hazard mitigation plan.

Lee County's Guiding Principles – Lisa Danner

The guiding principles serve as a framework for organizing the LMS goals and objectives. We want to consider preventive activity and reduce the risk to people property from the hazards that are identified in the plan. We want to protect our property, how can we protect our critical infrastructure? We want to look at that so we can reduce or avert that property damage. We want to look at the natural resource protection activities to preserve the natural areas. As well as emergency services measures activities, tornado, hurricane all of these disasters. We want to look at structure projects that help keep hazards away from identified areas. Anything you can do to help protect these structural projects. Public information or public education that will help educate property owners, and visitors, ways to protect them from hazards. Pre and post disaster redevelopment and mitigation policies and event and you want to get your community back to either pre disaster or maybe even stronger and better after an event has occurred. Maybe some redevelopment some projects into play or policies that can help navigate to help make your community stronger or at least back to pre disaster condition.

Planning Process – Public Meetings – Lisa Danner

One of the requirements though FEMA is we have to capture, and there is a process that we have to follow in either developing or updating plans. You guys are updating your LMS plan, so from a hazard mitigation planning team you already have this in place your LMS working Group. We will be reviewing the goals and objectives that are currently in the plan and talk about doing we want to change any of those goals and objectives. Do we want to add to or take any out? Anything that we add to or take out we have to explain why we are doing that. Anything that we add or revise we just have to explain to the state as well as FEMA

as to why we are doing this. We need to review or revise the current hazards, data and risk & vulnerabilities. We will go over this list we have currently a list of the hazards that are in the plan. Lee and the group have some technological hazards into the plan, and now would be the time to do when you do your update. We are going to review the hazards and will have to go back 5 years to 2010. Each hazard that is currently in the plan we will have to do this for and each hazard that we add. When FEMA and the state look at your plan they only look at natural hazards. However, you do have impacts from technological or man-made hazards that we will also, have to talk about and add into the plan and develop those strategies to go along with each of the hazards and update those currently in the plan. Conducting outreach to the public one of the things required is 3 to 5 public meetings they can be part of your working group plan or you can have them separate from the working group meeting. You just have to give the public an opportunity throughout the course of this process to comment and provide feedback on the things that the working group talks about. Incorporate stakeholder input this is what you guys are doing and providing the input and feedback if there are other people we need to involve we can do that we just need to get the stakeholder input. Follow the plan adoption steps it goes to state, goes to FEMA and comes back with a conditional approve then the county adopts it as well as the municipalities and then you have an approved plan for the next 5 years. FEMA as all there planning across the board they take that whole community approach, they want to be sure and want to see that everybody is included. In the past airports and schools were two stakeholders that did not come to the table and not part of the process. Good to see involvement with both now because there is and can have a big impact when an event does occur. Process for these working group meetings are they should be advertised and at the end of the meeting and minutes that we have a 10 minute public comment window or comment. Then people that are invited and want to come and then we will just need to document in the plan that we provided that opportunity.

<u>Review of Current LMS Goals & Objectives – Lisa Danner</u>

Goals and Objectives: These are what are currently in your LMS - Develop and maintain a hazard resistant community through application of hazard mitigation policies and identification, prioritization and achievement of cost effective mitigation projects.
Lee do you have any thoughts or comments on your overall goal? Lee Mayfield: It's basically what we are doing, some are more general goals. If you don't have an answer today we will follow up and work with you guys to get more concrete answers. Even though we are having meetings we will still be having conference calls, webinars and other community outreach to you guys to get information on the plan. There will be 3 onsite meetings along with any needed call meetings to discuss any strategies hazards or whatever the case may be. We do have a sub that is working with us and they will have worksheets and questionnaires that we will be sending out to everyone to file out and complete the data or information that we need to update the risk assessment and the hazard identification section. You have to make sure all the hazards identify and agree with the current risk assessment for the jurisdiction.

Goal 1: Support prevention activities and projects that reduce the risk of life and damage to property from identified hazards.
We will need to find out if this is still current. Will need to take a look at it to see if it is still good or need to make any changes to this goals and objectives. If we need to change the objectives we have to summarize changes done and why to make them current. Lee Mayfield: Will have to go through and get some updates. We will be adding Estero into the plan.
Goal 2: Support activities and projects that reduce or avert property damage on properties that have suffered repeated damage from identified hazards. For these activities and projects we need to come up with what helps support Goal 2. Lee Mayfield: The CRS is a one of the big components we want to make sure they have a chance to look at and incorporate what they need to.
Goal 3: Support natural resource protection activities that preserve or maintain natural areas. If there is something you need to add to this now is the time.
Goal 4: Support the achievement of emergency services activities taken during a disaster incident to reduce the hazards impact. FEMA doesn't say you have to do it this way so whatever the method the county has been using is the method that FEMA will approve for you to use. There is no set way of doing the risk and vulnerable assessment it just needs to be done. Lee Mayfield: We will need to take a look at what data needs to be pulled to use for this assessment. A lot of the natural hazards you pull the data from the national weather service, but we also rely on the public information too.
Goal 5: Support efforts to obtain funding for engineered projects that help keep the hazards impart away from identified vulnerable areas.

Goal 6: Encourage public support and commitment to local hazard mitigation effort by showing its benefits through public information activities that advise property owners, potential property owners, and visitors about hazards and ways to protect people and property from these hazards and the benefits of protecting our natural resources. This is pretty much a public outreach, outreach to visitors and the community. Anything you can think of that is providing information or giving information to the public, visitors or the community will support this goal.
Goal 7: Maintain current pre and post disaster redevelopment and mitigation policies and procedures designed to reduce or avert the community's future disaster potential. These are all the objectives that are in support of the goal. When making a broad statement you have to identify how and where. Lee Mayfield: Are those goals consistent with what you've seen in other plans? In most plans they have 4 or 5 goals, but that does not mean you can't have more. You have pretty much hit the highlights of all the key areas.

Review of Current Hazards – Lisa Danner

Currently the LMS has only natural hazards. We are going to be adding technological man-made hazards to the plan. Knowing that FEMA will not look at those technological and man-made hazards as it relates to approving the plan. However, if something becomes available you have identified the hazard, identified the risk and you have strategies to go along with those hazards and its plug and play and apply for the money into the grant and just pull it right out of your plan. Lee County's list has to be in concert with the state mitigation list as well.

Project Timeline/Next Steps – Lisa Danner

In regards to this project we are looking at mid to late February in being finished. Lee Mayfield: Would like to give the State something to look at in January and they are flexible with our schedule. The drop dead deadline that we have to have to the plan adopted is June of 2017. We wanted to give you guys a good couple months at least if not more. We are looking at the Draft LMS # 1 as January 20. 2017 and Drafts LMS # 2 for review is February 2, 2017 & the final updated LMS ready to submit to the State is February 15, 2017. The big thing is we need to come up with are two dates for planning meetings to review the

information that we have compiled and put together and come to a consensus on. FEMA at some point and time requires that we did the risk and vulnerability assessment did the hazard profiles and you guys have had the chance to review it and bless it, we ranked the hazards, high medium and low all of that. We need a meeting date in December and January to finish up and get a final plan done.

Next Meeting / Next Steps - Lee Mayfield

The two dates for planning meetings: Week of December 12th and January 18, 2017

December we will update the hazard identification and profiles as well as the risk and vulnerability assessment.
We will have all that information ready for you to review at this meeting.

January meeting will be spent on finalizing the first draft of the LMS ready to review. What we would like to do is get the information back a week to 10 days prior to the meetings and then we will send everything out to you guys to review.
Then at least before you come to the meeting you can review and digest the information and provide feedback.

The State approval is normally 30 to 60 days, so we just need to make sure we get this submitted on time. If the plan goes to FEMA and something happens you still are eligible for money and can apply for money.
Lee Mayfield: The project lists that everyone has been working on and any new projects that need to be added we will need to make sure we have time to build these into these meetings.

Adjourn

Motion to adjourn made by Jesse Spearo, Seconded by William Dalton. Meeting adjourned at 3:41 PM

December 13, 2016

Sign-In Sheet

	A	B	SIGN IN SHEET for 12/13/2016	D	E
2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
3	Abes, Ben	Lee County Public Safety	benjamin.abes@leegov.com	(239) 533-3961	
4	Ahmadi, Kevin		kevina@gulfcoastvillage.org		
5	Barden, Jack	Equal Opportunity Analyst	jbarden@leegov.com	(239) 533-2201	
6	Baucom, Warren	Lee County Economic Development	wbaucom@leegov.com	(239) 338-3161	
7	Beals, Nathan	Lee County Utilities	nbeals@leegov.com	(239) 533-8157	
8	Beck, Richard	Lee County Public Works Dept.	Rbeck@leegov.com	(239) 533-8822	
9	Benacquisto, Senator Lizbeth		benacquisto.lizbeth.web@flsenate.gov		
10	Bjostad, James	Lee County Emergency Mgmt	Jbjostad@leegov.com	(239) 533-0617	
11	Bowen, Trenton Chief	City of Fort Myers Fire Dept.	Tbowen@cityftmyers.com	(239) 321-7311	
12	Brady, Christine	Lee County Human Resources Director	cbrady@leegov.com	(239) 533-2348	
13	Bridges, Sandi	Lee County Emergency Mgmt	sbridges@leegov.com	(239) 533-0615	
14	Brown, Pam	Visitors Bureau / Conference & Event Manager	pbrown@leegov.com	(239) 338-3500	
15	Cain, John	American Red Cross	disaster@arclee.org	(239) 278-3401	
16	Campbell, Chris	City of Bonita Springs	Christopher.Campbell@cityofbonitasprings.org		
17	Campbell, Gerald	Emergency Manager - FGCU	gcampbell@fgcu.edu	(239) 590-1948	
18	Carter, Cindy	Lee County Parks & Recreation	ccarter@gmail.com	(239) 229-0493	
19	Carter, Linda	No Person Left Behind	mslindacarter@gmail.com	(239) 368-6846	
20	Cassidy, Frank	City of Bonita Springs	frank.cassidy@cityof bonitasprings.org	(239) 949-6257	
21	Cloutier, Peter	Internal Services / Mgr. Internal Serv. - Fiscal	pcloutier@leegov.com	(239) 533-8512	
22	Cochran, Don Chief	City of Cape Coral Fire Department	dcochran@capecoral.net		
23	Coleman, Kyle	Village of Estero	coleman@estero-fl.gov	(239) 221-5035	
24	Crawford, David		dcrawford@swfrpc.org		
25	Crisafulli, Susan	LCEC	susan.crisafulli@lcec.net	(239) 656-2399	
26	Dalton, Lt. William	Sanibel Police Department	bill.dalton@mysanibel.com	(239) 472-3111	
27	Daltry, Wyatt	City of Cape Coral	wdaltry@capecoral.net	(239) 573-3160	
28	Danner, Lisa	Hagerty Consulting	lisa.danner@hagertyconsulting.com	(423) 727-9058	
29	Davis, Jenny	Public Safety / Administrative Specialist	jldavis@leegov.com	(239) 533-3948	
30	Deerey, Aaron	Lee County Port Authority	amdeerey@flylcpa.com	(239) 590-4696	
31	Delrose, L	City of Fort Myers	ldelrose@cityftmyers.com		
32	Dobson, Kenny	School District of Lee County	KennethDD@leeschools.net	(239)0839-9083	
33	Doggett, Linda	Lee Clerk of Courts	ldoggett@leeclerk.org	(239) 533-2554	

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2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
34	Donley, Liz	Charlotte Harbor National Estuary Program	ldonley@chnep.org		
35	Drake, Dylan	Lee County Human Resources	Draked@leegov.com	(239) 533-2005	
36	Duncan, Danny	Sanibel Fire	Danny@sanibelfire.com		
37	Duncan, Gary E.	Lee County Port Authority	GEDuncan@flylcpa.com	(239) 590-4721	
38	Dunn, Brandon	Lee County Community Development	bdunn@leegov.com	(239) 533-8809	
39	Eck, Caitlyn	Lee County Health Department	Caitlyn.Eck@flhealth.gov	(239) 461-6128	
40	Eckert, Timothy	Parks & Recreation	teckert@leegov.com	(239) 432-2076	
41	**Farmer, Rob - DAC Chair**	Lee County Public Safety Director	rfarmer@leegov.com	(239) 533-3911	
42	Fenske, Jennifer	Lee County Public Safety	jfenske@leegov.com	(239) 533-3922	
43	Flanjack, Alise	Lee County Parks & Recreation	afanjack@leegov.com	(239) 533-7451	
44	Floyd, William	Lee County Emergency Mgmt	wfloyd@leegov.com	(239) 533-0611	
45	Fournier, Celeste	Lee County Emergency Mgmt	cfournier@leegov.com	(239) 533-0694	
46	Fournier, Jason	Lee County Solid Waste	JFournier@leegov.com	(239) 338-3302	
47	Frantz, Joe	Lee County DOT Operations	frantzja@leegov.com	(239) 533-9400	
48	Fraser, Andrea	Lee County Attorney	afraser@leegov.com	(239) 533-2236	
49	Gabrick, Eileen	Lee Clerk of Courts	egabrick@leeclerk.org	(239) 533-2124	
50	Gibbons, John	Southwest Florida Regional Planning Council	Jgibbons@SWFRPC.org	(239) 338-2550	
51	**Gooderham, Kate - Vice Chair**	Gooderham & Associates	kgooderham@comcast.net	(239) 489-2616	
52	Goyette, Paul	Lee County Lee Tran	pgoyette@leegov.com	(239) 533-0343	
53	Grant, Damon	Lee County Construction & Design	dgrant2@leegov.com	(239) 281-9086	
54	Grigsby, Melanie R	City of Ft. Myers	Mgrigsby@cityftmyers.com	(239) 321-7467	
55	Guirguis, Ehab	Lee County DOT Operations	eguiguis@leegov.com	(239) 533-9400	
56	Gulamali, Al	Lee County Port Authority	AnGulamali@flylcpa	(239) 590-4720	
57	Hamilton, Rebecca	Examiner	rhamilton@leegov.com	(239) 277-5020	
58	Hanna, Rebecca	Public Safety / Office Manager	rhanna@leegov.com	(239) 533-3973	
59	Harner, David	Parks and Recreation / Director	dharner@leegov.com	(239) 533-7408	
60	Harris, David	Budget Services / Manager, Budget Services	dharris@leegov.com	(239) 533-2301	
61	Hartwell, Judy	City of Fort Myers Fire Dept.	jhartwell@cityftmyers.com	(239) 321-7321	
62	Hayden, Kenneth	Community Association Manager	Ken@Hayden-Associates.com	(239) 489-4890	

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2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
63	Hayhurst, Patrick	Lee County School Dist.	PatrickJH@leeschools.net	(239) 337-8598	
64	Henninger, Lance	Sanibel Emergency Management	emergency.management@mysanibel.com	(239) 472-3111	
65	Henningson, John - Boca Grand		jchningson@aol.com		
66	Herrell, Lindsay	Lee County Emergency Management	lherrell@leegov.com	(239) 533-0601	
67	Higgins, Douglas	Lee County Public Safety	dhiggins@leegov.com	(239) 533-3916	
68	Higginbotham, Tom	Fort Myers Fire Department	thigginbotham@cityftmyers.com		
69	Hunter, Arleen	City of Bonita Springs	arleen.hunter@cityofbonitasprings.org		
70	Ink, James				
71	Jackson, Tricia	Lee County Budget Services	tjackson@leegov.com	(239) 533-2309	
72	Jacoby, Billie	Community Development	Bjacoby@leegov.com	(239) 533-8948	
73	Jerant, Andy	American Red Cross	andy.jerant@redcross.org		
74	Jordan, James	City of Sanibel	jimmy.jordan@mysanibel.com	(239) 472-4136	
75	Kazemi, Saeed	City of Ft. Myers	skazemi@cityftmyers.com	(239) 321-7215	
76	Keyes, Pam	Lee County Utilities	Pkeyes@leegov.com	(239) 533-8544	
77	Kinsey, Philip	Bonita Fire	Kinsey@bonitafire.org		
78	Kirton, Kim	Public Resources / Administrative Specialist	kkirton@leegov.com	(239) 533-2107	
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80	Kreiger, Lisa	Natural Resources / Operations Manager	LKreiger@leegov.com	(239) 533-8706	
81	Kreuz, Jeanette	Fort Myers Police Department	jkreuz@fmpolice.com	(239) 321-7759	
82	LaGuardia, Joan	Lee County ~~Community Development~~ Admin	jlaguardia@leegov.com	(239) 533-8705	
83	LaMontagne, Timothy	Solid Waste / Solid Waste Coordinator	tlamontagne@leegov.com	(239) 533-8960	
84	Larsen, Sandy	City of Sanibel	sandy.larsen@mysanibel.com	(239) 472-6397	
85	Lassiter, Trish	LCEC	Trish.Lassiter@lcec.net	(239) 292-3143	
86	Le-Blanc-Hutchings, Lisa	Lee County Port Authority	llleblanc-hutchings@flylcpa.com	(239) 590-4852	
87	Liggins, Mike		MLiggins@bsu.us		
88	Love, Jim	Lee County Health Department	James.Love@flhealth.gov	(239) 690-2103	
89	Lovejoy, Donna	City of Fort Myers	dlovejoy@cityftmyers.com	(239) 321-7217	
90	Loveland, David	Lee County Dept. of Transportation	Loveladm@leegov.com	(239) 478-8509	
91	Lucia, Scott Captain	Lee County Sheriff's Dept.	SLucia@Sheriffleefl.org	(239) 477-1086	
92	Mallow, Terry	Lee Clerk of Courts	tmallow@leeclerk.org	(239) 533-2184	
93	Manzo, Barbara	Lee County Parks & Recreation	Barbara@leegov.com	(239) 533-7412	
94	Marichal, Terry	Public Safety / Administrative Specialist	cmarichal@leegov.com	(239) 533-3964	

	A	B	SIGN IN SHEET for 12/13/2016	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
95	Margolis, Senator Gwen		margolis.gwen.web@flsenate.gov		
96	Massey, David	Lee County Emergency Mgmt			
97	Mayfield, Lee	Lee County Emergency Mgmt	Lmayfield@leegov.com	(239) 533-0620	
98	Mazurkiewicz, Heather	Lee Building Industry Assoc.	Heather@bia.net	(239) 936-5525	
99	Mercado, Roger	Lee County Human Services	rmercado@leegov.com	(239) 533-7930	
100	McGee, Jim	Lee County Historic Preservation Board	jmdgee@otc1.com	(239) 671-6267	
101	McIntyre, Ed	Lee County Parks & Recreation	Mcintyee@leegov.com	(239) 590-0554	
102	Miller, Rita	Lee Clerk of Courts	rmiller@leeclerk.org		
103	Moore, Steven Chief		scmoore@fgcu.edu		
104	Murphy, Gerald	Murphy Planning	jerry@murphyplanning .com	(239) 322-8510	
105	Myers, Steve	Lee County Transit	Slmyers@leegov.com	(239) 277-5012	
106	Nadler, Kristi	Lee County Emergency Mgmt	knadler@leegov.com	(239) 533-0610	
107	Nelson, Stanley		snelson@sheriffleefl.org		
108	Nesbit, Chief Larry	Bayshore Fire & Rescue	Chief@bayshorefire.org	(239) 543-3443	
109	Noble, Matthew	DCD Planning / Principal Planner	mnoble@leegov.com	(239) 533-8548	
110	Norvell, Jeremy	Lee County DOT	jnorvell@leegov.com	(239) 533-9400	
111	Ottolini, Roland	Natural Resources / Division Director	rottolini@leegov.com	(239) 533-8127	
112	Parry, Gisele	Hagerty Consulting	gisele.parry@hagertyconsulting.com		
113	Pigott, Tamara	Visitors and Convention	tpigott@leegov.com	(239) 533-6715	
114	Porter, Gary	Manager	gporter@leegov.com	(239) 498-0157	
115	Pringle, Bonnie		Bonniegiwa@comcast.net		
116	Quimby, Debbie	Lee County Emergency Management	dquimby@leegov.com	(239) 533-3640	
117	Richardson		urichardson@ralaw.com		
118	Richter, Garrett Senator		richter.garrett.web@flsenate.gov		
119	Ringle, Rachel	Cape Coral Emergency Management	ringle@capecoral.net	(239) 242-3635	
120	Rodgers, Michelle	Lee County Emergency Management	mrodgers@leegov.com	(239) 533-0605	
121	Rodriguez, Alberto Dr	Lee County School District	AlbertoR@leeschools.net	(239) 337-8106	
122	Rooker, Kathleen	Captiva Erosion District	mycepd8@gmail.com	229-472-247	
123	Sampson, Lindsey	Lee County Solid Waste	sampsolj@leegov.com	(239) 338-3302	
124	Schwing, Carl	City of Bonita Springs	carl.schwing@cityofbonitasprings.org		
125	Scott, Denise	Lee County Website Coordinator Content	dscott@leegov.com	(239) 533-2306	
126	Seeley, Ellen	City of Cape Coral Fire Dept.	eseeley@capecoral.net	(239) 573-3022	

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2	Attendees	Agency	Email Addresses	Office Phone #	Signature
127	Simmons, Clay	Lee County DOT	wsimmons@leegov.com	(239) 533-8803	
128	Smith, Holly	Private Citizen of Sanible	boatclub411@gmail.com	(239) 707-9800	
129	Smith, Jennifer	Lee County Florida Health	Jennifer.Smith3@flhealth.gov	(850) 631-1271	
130	Smith, Stephen	ARES/RACES	W9GPI@ARRL.net	(920) 251-6249	
131	Solich, John	Lee County DOT Operations	jsolich@leegov.com	(239) 533-9400	
132	Southall, Robert	Lee County Transit	rsouthall@leegov.com	(239) 533-0363	
133	Spearo, Jesse	Cape Coral Emergency Management	jspearo@capecoral.net	(239) 242-3611	
134	Stead, Ken		ken@swfmia.com		
135	Stelmacki, Sonny	Lee County School Dist.	Sonnyas@leeschools.net		
136	Stewart, Bob	Lee County Building Services	Rstewart@leegov.com	(239) 533-8320	
137	Tapfumaneyi, Sandra	Lee County Emergency Mgmt	stapfumaneyi@leegov.com	(239) 533-0614	
138	Thompson, Richard	City of Fort Myers	rthompson@cityftmyers.com	(239) 321-7630	
139	Tomlinson, Bill	City of Sanibel Police Dept.	Bill.tomlinson@ci.sanibel.fl.us	(239) 472-3111	
140	Trescott, Dan	SW FL Regional Planning Council	DTrescott@swfrpc.org	(239) 338-2550 x220	
141	Vance, Audrey	City of Bonita Springs	audrey.vance@cityofbonitasprings.org		
142	Vanderbrook, Scott	Estero Fire Dept.	yanderbrook@esterofire.org	(239) 390-8000	
143	Vidal, Denis	LCEC	denise.vidal@lcec.net		
144	Wade, Doug	Lee Memorial	dwade@leememorial.org		
145	Weis, Dan	Construction and Design	dweis@leegov.com	(239) 707-6719	
146	Walker, Tim	SWFL Regional Planning Council	twalker@swfrpc.org	(239) 338-2550	
147	Wheaton, Patti	Medical Examiners Office, Lee County	Pwheaton@leegov.com	(239) 277-5020	
148	Will, Megan	Town of Fort Myers Beach	Megan@FortMyersBeachFL.gov	(239) 765-0202	
149	Wilson, Hans	SW FL Marine Industries Association	hans@hanswilson.com	(239) 656-7083	
	Zambito, Chris	Dunberry	CZambito@dunberry.com	813 421-8695	

Meeting Minutes

DISASTER ADVISORY COUNCIL
Joint Unified Local Mitigation Strategy Update Project
LMS WORKING GROUP MEETING #2
December 13, 2016

Beals, Nathan - Lee County Utilities
Campbell, Gerald – Florida Gulf Coast University
Cassidy, Frank – City of Bonita Springs
Dalton, William – Sanibel Police Department
Daltry, Wyatt – City of Cape Coral
Davis, Jenny - Lee County Public Safety
Dunn, Brandon - Lee County Community Development
Eck, Caitlyn – Lee County Health Department
Fournier, Celeste - Lee County Emergency Management
Grant, Damon – Lee County Construction & Design
Hartwell, July – City of Fort Myers Fire Department
Jacoby, Billie – Lee County Community Development
LaGuardia, Joan – Lee County Admin
Larsen, Sandy – City of Sanibel
Le-Blanc-Hutchings, Lisa – Lee County Port Authority
Love, Jim – Lee County Health Department
Mayfield, Lee - Lee County Emergency Management
Mercado, Roger – Lee County Human Services
Quimby, Debbie - Lee County Emergency Management
Rooker, Kathleen – Captiva Erosion District
Smith, Stephen – ARES/RACES
Tapfumaneyi, Sandra–Lee County Emergency Management
Thompson, Richard – City of Fort Myers
Vanderbrook, Scott – Estero Fire Department
Walker, Tim – SWFL Regional Planning Council
Weis, Dan – Construction and Design
Zambito, Chris – Dewberry

Agenda Items

- Welcome and Introductions
- Project Meeting
    - Core Hazards List
    - Risk Assessment Methodology
    - LMS Project/Strategies Discussion
    - Project Timeline
    - Next Steps
- Questions
- Final Comments/Adjourn

Lee Mayfield, Emergency Planning Manager opened the meeting at 10:38 am on 12/3/16.

Minute Approvals

Motion to approve meeting minutes from 11/1/16 made by Frank Cassidy, Seconded by William Dalton. All in favor.

Welcome and Introduction - Lee Mayfield

Thanks everyone for attending. In about two months we will have a brand new fancy Local Mitigation Strategy that you guys can take back to your city commissioners and everybody else to brag about and say this is our county wide Mitigation Plan. We will have our vendor Lisa from Hagerty and Chris from Dewberry talk a little about hazards today. If you remember our last meeting we talked about goals and objectives which were a big check box and we wanted to make sure they were still all valid. Today we will be talking about what are our hazards in Lee County. It's easy to think of and just say hurricanes, tornados and terrorism, but what does that really mean when we put pencil to paper and adding it to our plan. We were able to suggest about 15 hazards and we will go over them to make sure everyone is okay with them. From natural to man-made hazards and everything in between we have another list of hazards which are more secondary hazards that we are not going to focus on too much in the plan, but we do want to mention. Today we will mainly focus on the primary hazards that we put time and effort into, the ones we base our exercises off of.

Lisa Danner - Hagerty Consulting
Glad everyone could come back today and we didn't scare you off at the last meeting. Basically as Lee was saying we are going to talk about the Core Hazards list and then the Methodology for the Risk Assessment. Everything in the updated plan is build around your Core Hazards and identify those Core Hazards and what your risks are. Dewberry is going to be doing the Risk Assessment piece over the course of the next month or so. They will be talking about what that Methodology is going to be and get any thoughts or feedback regarding to that. We have to come up with that Core Hazards list as to what the impacts and effects are going to be for Lee County. Then we will talk a little about the projects and strategies that are currently in the plan as well as any new strategies or projects that municipalities or county may have.

We will talk more about the project timeline and where we are at with the project and the next steps. The end result will be a final
completed updated Hazard Mitigation Plan or a LMS document done and ready to submit it to the State by the 1st or 2nd week of February. The plan is good for 5 years and has to be updated; you don't want the plan to run out, so our timeline is trying to get everything done by the course of the 1st part of February. I will turn it over to Chris from Dewberry. He will talk about the Core Hazards and the Methodology for the Risk Assessment.

Core Hazards List – Chris Zambito - Dewberry

Good morning everyone-I appreciate everyone being here. My name is Chris Zambito. I used to work with Hillsboro County for 10 years in their Planning and Growth Management doing their Mitigation Strategy back in 1998 when Florida kind of first kicked things off. I have been with Dewberry now for about 8 years, so I have interacted with some of you as well with the flood maps for you guys. We are going to talk a little about the Core Hazards and address some of the other things as well, with just a paragraph or a narrative. We have listed your traditional hazards and we just need to get a feel from you guys if this is still working and where you want to go for the hazards listed. Is there anything that you would want to change on this list? The ones on the list that are highlighted are the ones we will be putting the most focus on. Before we jump into this is there any direction that you want to go for the items (man-made) on the bottom of the list?

Lee Mayfield - The thinking has been to have this list contain comprehensive and not only natural hazards. The Federal government says on your LMS you only have to have natural hazards listed. We know we have a lot more hazards than that and want to be consistent and want to have one list of hazards that can be translated to all our various plans that we all work on through our jurisdictions. We added the cyber attack on there and we talked a lot about the word terrorism and having the word terrorism in there. Some counties chose to have that as an overarching hazard. Our thinking was there are a lot of things on the list that could be considered terrorism, so don't think that it's not in there. A good chunk of them could be terrorism, so we wanted to break it down a little bit more, so we could incorporate all those hazards that we plan and train for.
Celeste Fournier - It also, reflects how our CEMP is written and laid out in sections. Regardless of the cause the factor this is what we deal with it still has the same outcome and the outcome is what we are focused on.
Joan LaGuardia – We have two physical map revisions pending, but it won't be done in time.
Chris Zambito - We could certainly add this to the narrative portion.
Lisa Danner – What about the cyber attacks, are there any data or any studies that we can tap into or use?
Celeste Fournier - We have not personally done one, but have the reports that FDLE has done studies in Florida, so they have been monitoring cyber attacks. They have data that I'm sure that could provide you with from the attacks and frequencies.

I think you have brought up a couple of good points if we can tailor this plan so it ducktails into other things that you are doing so you can get a multiply effect on the plans it's helpful to us and you guys too. If you have wildfire protection plan that's going on and we are not aware of it or some water shed studies or something this would be helpful for us to use whatever the data is, so that your plans are using the same thing. For the storm surge flooding we can use the probable version or unless you have something else for planning purposes we can use that too. We will try to tailor these so you have results that are meaningful to you, but ultimately a lot of the risk assessment is just going to bleed in to what FEMA wants to see; which is how you are addressing those vulnerabilities. Are there any studies that you guys are doing right now that would affect these hazards? Are you collecting any of this information through Public Works or anything from the recent storms that have passed?
Lee Mayfield - Natural Resource people should be able to help in this area. What information to you need from me or us on these hazards?
Chris Zambito - If you want to just give us a list of contact names we will reach out to them. Any community rating system cycles? Could you provide us with competitive loss impact areas? Any external agencies that are not here, but need to provide any data to us?
Lee Mayfield - We need to touch base with Forestry Department.
Chris Zambito - Are there any electric utility data and are they typically involved with this group?
Lee Mayfield - We can get data or feedback from them.
Chris Zambito - As Lisa mentioned we have a pretty tight window to try and do this, so we want to focus on getting any data before the end of the year and January crunch through the results and then providing you guys with a draft.

Risk Assessment Methodology

Lisa Danner – FEMA or State doesn't say you have to do it this way they just want to see that you have a Methodology in place on how you are ranking your hazards and things in the plan. So, if you are assigning it a high, medium, low, major or minor whatever the case maybe they just want to see there is a method to your madness. They don't say you have to do it this way, but there is a Methodology in place of ranking the things that you go through and look at in the plan.
Lee Mayfield - The verbiage and the plan will reflect that too. Whatever we list as a natural hazard here you have to have some king of mitigation strategy for it.

Lisa Danner – In Texas they are saying that for anything ranked high or medium you have to come up with two mitigation strategies. We will have to see what Florida is adhering to. They do want to see one mitigation strategy for each of the core hazards you have identified, so will have to check to see what the state allows at their level. Even over the course of the next couple months we will have some conference calls to get feedback from the group and make sure the ranking is agreed on. As, Chris is saying we just need to have justification on why we are ranking it the way we are ranking it.

LMS Project/Strategies Discussion

Lee Mayfield – So far, Sanibel and Fort Myers Beach have really looked at their project list in detail. They have wiped some of the projects off the list. Next meeting in January is really going to be crunch time as far as adding projects to your cities list or taking them off. I also, have some work to do with getting with some county departments to go over our list. Especially with the cities I will be right there with you working with your leadership or your different departments within your jurisdictions to go over the list. Make sure for the next meeting a few things are done. Take off any projects or strike through any projects that you don't want on the list anymore. They are either completed, no use for them anymore, funding dried up or you moved on from that idea. The bulk of the work is going to come with new projects. (In the back there are project ranking forms) We will have to talk through these projects and they will have to be ranked. These forms will need to be filled out before the next meeting. The only scoring that you don't fill out is on page 2 which is the level of public demand—this will be discussed as a group.
Bill Dalton – From 2011, I believe we had 6 initiatives on and have completed several of them. One was a project with our Sanibel community house they wanted $300,000 to put towards their overall renovations to harden it for hurricanes. Then the people who ran that organization started to blur the lines thinking it could be shelter or a shelter of last resort. We had a disagreement as far as whether that was appropriate, so it never got funded and as we speak that building is almost complete with renovation that they did with private funds. We added 5 things to the list that are new and one was already completed, so wasn't sure if we could seek any reimbursement. Our recreation center we always tabbed it as a comfort station after a storm, so people could go there, spend some time in the ac, take a shower and so forth, but we never tested it as far as bringing a tractor trailer size generator in and hooking it up and running it. We did that this year it cost about $6,000.00 to mobilize and get it out and run for 2 hours. Our previous Chief said that the ranking/scoring document at our city was done at a department director level. They sat all the department directors down, listed the projects and came up with the appropriate score. This is how I will propose we do it for the 4 new ones we have. We should be able to have this done by the next meeting with no problem. If done before, I will email them over to you.
Lee Mayfield – Bill has done a good job taking this back to his group. The next meeting the time consuming part will be for every one of those projects. Example: Bill will present a quick 5 minute background on the project; how he scored the different items and then we will all have an open group discussion. If you have questions on projects, please call me or talk about at these meetings. We are pretty open to what is on the list, and not everything is all hurricane money. Even if it's not funded by the next hurricane pot of money it's still valid to have on the list. If it's not on the list when we go for approval in June or before, we have these all the time. These are living documents and priorities, funding, and people change, so don't feel like if you missed the opportunity in January or February, the next meeting if you have a project bring it forward and we will put it on the list.

Lisa Danner - As Lee was saying, funding changes all the time and if funding comes down and you don't have it in the current plan it doesn't mean that project strategy isn't eligible for money, you can still put in for it. The big thing is when you're looking at your projects and strategies that you tie them back into the risk assessment. It has to be tied back into either a hazard or a multi hazards to get funding. FEMA likes to see that you are not just seeking grant money that you're also, looking for private public partnerships as well. Are there any strategies or projects that you have questions on?
Lee Mayfield - One of the questions we were talking about was one of our new municipalities-Estero. They are official with Lee County now and they contract out a lot of their services. They did incorporate, but rely on the county to provide a lot of their services still and that may change over time. Chief and I were talking that they might want to have projects on the list and how do they add when they don't own or manage a lot of the infrastructure in their city. Does every municipality have to have a project on the list?
Chris Zambito – It can be general education type projects (such as putting something in the library to make people aware of the hazard or they may want to say we are looking to have a community center, town hall structure build instead of leasing it) Not every project has to be a 5 million dollar project. It could be something as easy as check the box for them that they are not going to get all upset about and be compliant with.
Gerald Campbell – I think what Scott is asking is my question to. My understanding of the regulation is that to be eligible you have to be an active part of the mitigation group and then your project has to be on the list. There is nothing that says you have to have a project on the list before the event because unless you guys are going to change it you can add it to the list any time. You can be part of the process and not have a project on the list.
Lee Mayfield - We will double confirm that you guys are good with not having anything on the list.
Scott Vanderbrook – You did confirm I believe at the first meeting that it does not have to be a city, village or county.
Lee Mayfield – Yes, everybody will have their jurisdiction and anyone can propose a project.

Project Timeline

February 15th is the deadline. Between now and the next meeting we will be reaching out to individuals, departments and agencies to collect data to do the risk assessment for the core hazards. Once the risk assessment draft completed we will do a conference call, but one of the things we wanted to talk about is doing the next LMS working group meeting. After discussion the meeting will be scheduled for Friday, January 27th from 2pm to 4 pm.

Phase 1: Initiate Project & Ensure Compliance

Kickoff Meeting – Planning Meeting #1	November 1, 2016
Final Project Management Plan	November 15, 2016

Phase 2: Update Hazard and Risk Vulnerability Assessment

Draft Update of the Hazard and Threat Profile	January, 2017

Phase 3: Update Joint Unified Local Mitigation Strategy

Draft LMS # 1	January 20, 2017
Draft LMS # 2	February 2, 2017
Final Update LMS	February 15, 2017

Phase 4: Gain Approval for the Lee County Joint Unified Local Mitigation Strategy

Plan Adoption Assistance	June 2017

Next Steps

- Continue data collection
- Conduct public meeting # 2 (in conjunction with next DAC/LMS Working Group Meeting)
- Update Hazard Identification and Profiles
- Update risk assessment and consequence analysis

Adjourn

Motion to adjourn made by Frank Cassidy, Seconded by William Dalton. Meeting adjourned at 11:42 am

January 27, 2017

Public Notice

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PUBLIC NOTICE

County's Local Mitigation Strategy Update

PLEASE BE ADVISED that Lee County Emergency Management will hold a public meeting where concerns and comments will be heard in order to update the County's Local Mitigation Strategy. The meeting will be held on Friday, January 27th, 2017 from 2:00pm – 4:00pm at the Lee County Emergency Operations Center – 2675 Ortiz Ave Fort Myers, FL 33905.

The Local Mitigation Strategy (LMS) establishes a plan to make the County safer from a variety of hazards and to reduce long term deaths and property damage. Federal rules require that local governments maintain a Local Mitigation Strategy to receive several types of disaster related assistance grants. Public comment is a federal requirement for plan approval.

Lee County Emergency Management encourages the public to view the draft version of the plan at the website: https://www.leegov.com/publicsafety/emergencymanagement/plan/mitigation

Comments on the plan can be directed to: Lee Mayfield, Lee County Public Safety/Emergency Management, 239-533-0622, lmayfield@leegov.com.

Public input in the development of the Local Mitigation Strategy will ensure that the money is spent on mitigation projects that benefit the community most. Lee County Emergency Management needs help in identifying places that are at risk to natural hazards and projects that could be carried out to mitigate the hazards. Hazard mitigation actions include: prevention, property protection, public education, natural resource protection, emergency services protection and structural projects. Lee County Emergency Management is looking for mitigation project ideas.

If you have a disability that will require special assistance or accommodations for your attendance at the public hearing, please call Lee County Administration at 239-533-2221 for information.
PO: Westen L012017-27
AD#1807194 1/20/2017

Sign-In Sheet

	A	B	SIGN IN SHEET for 1/27/2017	D	E
2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
3	Abes, Ben	Lee County Public Safety	benjamin.abes@leegov.com	(239) 533-3961	
4	Ahmadi, Kevin		kevina@gulfcoastvillage.org		
5	Barden, Jack	Equal Opportunity Analyst	jbarden@leegov.com	(239) 533-2201	
6	Beals, Nathan	Lee County Utilities	nbeals@leegov.com	(239) 533-8157	
7	Benacquisto, Senator Lizbeth		benacquisto.lizbeth.web@flsenate.gov		
8	Bjostad, James	Lee County Emergency Mgmt	Jbjostad@leegov.com	(239) 533-0617	
9	Bowen, Trenton Chief	City of Fort Myers Fire Dept.	Tbowen@cityftmyers.com	(239) 321-7311	
10	Brady, Christine	Lee County Human Resources Director	cbrady@leegov.com	(239) 533-2348	
11	Bridges, Sandi	Lee County Emergency Mgmt	sbridges@leegov.com	(239) 533-0615	
12	Brown, Pam	Visitors Bureau / Conference & Event Manager	pbrown@leegov.com	(239) 338-3500	
13	Cain, John	American Red Cross	disaster@arclee.org	(239) 278-3401	
14	Campbell, Chris	City of Bonita Springs	Christopher.Campbell@cityofbonitasprings.org		
15	Campbell, Gerald	Emergency Manager - FGCU	gcampbell@fgcu.edu	(239) 590-1948	
16	Carter, Cindy	Lee County Parks & Recreation	ccarter@gmail.com	(239) 229-0493	
17	Carter, Linda	No Person Left Behind	mslindacarter@gmail.com	(239) 368-6846	
18	Cassidy, Frank	City of Bonita Springs	frank.cassidy@cityof bonitasprings.org	(239) 949-6257	
19	Cloutier, Peter	Internal Services / Mgr. Internal Serv. - Fiscal	pcloutier@leegov.com	(239) 533-8512	
20	Cochran, Don Chief	City of Cape Coral Fire Department	dcochran@capecoral.net		
21	Coleman, Kyle	Village of Estero	coleman@estero-fl.gov	(239) 221-5035	
22	Crawford, David		dcrawford@swfrpc.org		
23	Crisafulli, Susan	LCEC	susan.crisafulli@lcec.net	(239) 656-2399	
24	Dalton, Lt. William	Sanibel Police Department	bill.dalton@mysanibel.com	(239) 472-3111	
25	Daltry, Wyatt	City of Cape Coral	wdaltry@capecoral.net	(239) 573-3160	
26	Danner, Lisa	Hagerty Consulting	lisa.danner@hagertyconsulting.com	(423) 727-9058	
27	Davis, Jenny	Public Safety / Administrative Specialist	jldavis@leegov.com	(239) 533-3948	
28	Deerey, Aaron	Lee County Port Authority	amdeerey@flylcpa.com	(239) 590-4696	
29	Delrose, L	City of Fort Myers	ldelrose@cityftmyers.com		
30	Dobson, Kenny	School District of Lee County	KennethDD@leeschools.net	(239)0839-9083	
31	Doggett, Linda	Lee Clerk of Courts	ldoggett@leeclerk.org	(239) 533-2554	
32	Donley, Liz	Charlotte Harbor National Estuary Program	ldonley@chnep.org		
33	Drake, Dylan	Lee County Human Resources	Draked@leegov.com	(239) 533-2005	

1

	A	B	SIGN IN SHEET for 1/27/2017	D	E
2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
34	Duncan, Gary E.	Lee County Port Authority	GEDuncan@flylcpa.com	(239) 590-4721	
35	Dunn, Brandon	Lee County Community Development	bdunn@leegov.com	(239) 533-8809	
36	Eck, Caitlyn	Lee County Health Department	Caitlyn.Eck@flhealth.gov	(239) 461-6128	
37	Eckert, Timothy	Parks & Recreation	teckert@leegov.com	(239) 432-2076	
38	**Farmer, Rob - DAC Chair**	Lee County Public Safety Director	rfarmer@leegov.com	(239) 533-3911	
39	Fenske, Jennifer	Lee County Public Safety	jfenske@leegov.com	(239) 533-3922	
40	Flanjack, Alise	Lee County Parks & Recreation	afanjack@leegov.com	(239) 533-7451	
41	Floyd, William	Lee County Emergency Mgmt	wfloyd@leegov.com	(239) 533-0611	
42	Fournier, Celeste	Lee County Emergency Mgmt	cfournier@leegov.com	(239) 533-0694	
43	~~Fournier, Jason~~	~~Lee County Solid Waste~~	~~JFournier@leegov.com~~	~~(239) 338-3302~~	
44	Frantz, Joe	Lee County DOT Operations	frantzja@leegov.com	(239) 533-9400	
45	Fraser, Andrea	Lee County Attorney	afraser@leegov.com	(239) 533-2236	
46	Gabrick, Eileen	Lee Clerk of Courts	egabrick@leeclerk.org	(239) 533-2124	
47	Gibbons, John	Southwest Florida Regional Planning Council	Jgibbons@SWFRPC.org	(239) 338-2550	
48	**Gooderham, Kate - Vice Chair**	Gooderham & Associates	kgooderham@comcast.net	(239) 489-2616	
49	Goyette, Paul	Lee County Lee Tran	pgoyette@leegov.com	(239) 533-0343	
50	Grant, Damon	Lee County Construction & Design	dgrant2@leegov.com	(239) 281-9086	
51	Grigsby, Melanie R	City of Ft. Myers	Mgrigsby@cityftmyers.com	(239) 321-7467	
52	Guirguis, Ehab	Lee County DOT Operations	eguiguis@leegov.com	(239) 533-9400	
53	Gulamali, Al	Lee County Port Authority	AnGulamali@flylcpa	(239) 590-4720	
54	Hamilton, Rebecca	Examiner	rhamilton@leegov.com	(239) 277-5020	
55	Hanna, Rebecca	Public Safety / Office Manager	rhanna@leegov.com	(239) 533-3973	
56	Harner, David	Parks and Recreation / Director	dharner@leegov.com	(239) 533-7408	
57	Harris, David	Budget Services / Manager, Budget Services	dharris@leegov.com	(239) 533-2301	
58	Hartwell, Judy	City of Fort Myers Fire Dept.	jhartwell@cityftmyers.com	(239) 321-7321	
59	Hayden, Kenneth	Community Association Manager	Ken@Hayden-Associates.com	(239) 489-4890	
60	Hayhurst, Patrick	Lee County School Dist.	PatrickJH@leeschools.net	(239) 337-8598	
61	Henninger, Lance	Sanibel Emergency Management	emergency.management@mysanibel.com	(239) 472-3111	
62	Henningson, John - Boca Grand		jchningson@aol.com		

2

	A	B	SIGN IN SHEET for 1/27/2017	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
63	Herrell, Lindsay	Lee County Emergency Management	lherrell@leegov.com	(239) 533-0601	
64	Higgins, Douglas	Lee County Public Safety	dhiggins@leegov.com	(239) 533-3916	
65	Higginbotham, Tom	Fort Myers Fire Department	thigginbotham@cityftmyers.com		
66	Hunter, Arleen	City of Bonita Springs	arleen.hunter@cityofbonitasprings.org		
67	Ink, James				
68	Jackson, Tricia	Lee County Budget Services	tjackson@leegov.com	(239) 533-2309	
69	Jacoby, Billie	Community Development	Bjacoby@leegov.com	(239) 533-8948	
70	Jerant, Andy	American Red Cross	andy.jerant@redcross.org		
71	Jordan, James	City of Sanibel	jimmy.jordan@mysanibel.com	(239) 472-4136	
72	Kazemi, Saeed	City of Ft. Myers	skazemi@cityftmyers.com	(239) 321-7215	
73	Keyes, Pam	Lee County Utilities	Pkeyes@leegov.com	(239) 533-8544	
74	Kinsey, Philip	Bonita Fire	Kinsey@bonitafire.org		
75	Kirton, Kim	Public Resources / Administrative Specialist	kkirton@leegov.com	(239) 533-2107	
76	Klein, Bonnie	Facilities Construction & Management Life Safety	bklein@leegov.com	(239) 707-5668	
77	Kreiger, Lisa	Natural Resources / Operations Manager	LKreiger@leegov.com	(239) 533-8706	
78	Kreuz, Jeanette	Fort Myers Police Department	jkreuz@fmpolice.com	(239) 321-7759	
79	LaGuardia, Joan	Lee County Admin	jlaguardia@leegov.com	(239) 533-8705	
80	LaMontagne, Timothy	Solid Waste / Solid Waste Coordinator	tlamontagne@leegov.com	(239) 533-8960	
81	Larsen, Sandy	City of Sanibel	sandy.larsen@mysanibel.com	(239) 472-6397	
82	Lassiter, Trish	LCEC	Trish.Lassiter@lcec.net	(239) 292-3143	
83	Le-Blanc-Hutchings, Lisa	Lee County Port Authority	lleblanc-hutchings@flylcpa.com	(239) 590-4852	
84	Liggins, Mike		MLiggins@bsu.us		
85	Love, Jim	Lee County Health Department	James.Love@flhealth.gov	(239) 690-2103	
86	Lovejoy, Donna	City of Fort Myers	dlovejoy@cityftmyers.com	(239) 321-7217	
87	Loveland, David	Lee County Dept. of Transportation	Loveladm@leegov.com	(239) 478-8509	
88	Lucia, Scott Captain	Lee County Sheriff's Dept.	SLucia@Sheriffleefl.org	(239) 477-1086	
89	Mallow, Terry	Lee Clerk of Courts	tmallow@leeclerk.org	(239) 533-2184	
90	Manzo, Barbara	Lee County Parks & Recreation	Barbara@leegov.com	(239) 533-7412	
91	Marichal, Terry	Public Safety / Administrative Specialist	cmarichal@leegov.com	(239) 533-3964	
92	Mayfield, Lee	Lee County Emergency Mgmt	Lmayfield@leegov.com	(239) 533-0620	
93	Mazurkiewicz, Heather	Lee Building Industry Assoc.	Heather@bia.net	(239) 936-5525	
94	Mercado, Roger	Lee County Human Services	rmercado@leegov.com	(239) 533-7930	

3

	A	B	SIGN IN SHEET for 1/27/2017	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
95	McGee, Jim	Lee County Historic Preservation Board	jmdgee@otc1.com	(239) 671-6267	
96	McIntyre, Ed	Lee County Parks & Recreation	Mcintyee@leegov.com	(239) 590-0554	
97	Miller, Rita	Lee Clerk of Courts	rmiller@leeclerk.org		
98	Moore, Steven Chief		scmoore@fgcu.edu		
99	Murphy, Gerald	Murphy Planning	jerry@murphyplanning.com	(239) 322-8510	
100	Myers, Steve	Lee County Transit	SImyers@leegov.com	(239) 277-5012	
101	Nadler, Kristi	Lee County Emergency Mgmt	knadler@leegov.com	(239) 533-0610	
102	Nelson, Stanley		snelson@sheriffleefl.org		
103	Nesbit, Chief Larry	Bayshore Fire & Rescue	Chief@bayshorefire.org	(239) 543-3443	
104	Noble, Matthew	DCD Planning / Principal Planner	mnoble@leegov.com	(239) 533-8548	
105	Norvell, Jeremy	Lee County DOT	jnorvell@leegov.com	(239) 533-9400	
106	Ottolini, Roland	Natural Resources / Division Director	rottolini@leegov.com	(239) 533-8127	
107	Parry, Gisele	Hagerty Consulting	gisele.parry@hagertyconsulting.com		
108	Pigott, Tamara	Visitors and Convention	tpigott@leegov.com	(239) 533-6715	
109	Porter, Gary	Manager	gporter@leegov.com	(239) 498-0157	
110	Pringle, Bonnie		Bonniegiwa@comcast.net		
111	Quimby, Debbie	Lee County Emergency Management	dquimby@leegov.com	(239) 533-3640	
112	Ringle, Rachel	Cape Coral Emergency Management	ringle@capecoral.net	(239) 242-3635	
113	Rodgers, Michelle	Lee County Emergency Management	mrodgers@leegov.com	(239) 533-0605	
114	Rodriguez, Alberto Dr	Lee County School District	AlbertoR@leeschools.net	(239) 337-8106	
115	Rooker, Kathleen	Captiva Erosion District	mycepd8@gmail.com	(239) 472-2477	
116	Sampson, Lindsey	Lee County Solid Waste	sampsolj@leegov.com	(239) 338-3302	
117	Schwing, Carl	City of Bonita Springs	carl.schwing@cityofbonitasprings.org		
118	Scott, Denise	Lee County Website Coordinator Content	dscott@leegov.com	(239) 533-2306	
119	~~Seeley, Ellen~~	~~City of Cape Coral Fire Dept.~~	~~eseeley@capecoral.net~~	~~(239) 573-3022~~	
120	Simmons, Clay	Lee County DOT	wsimmons@leegov.com	(239) 533-8803	
121	Smith, Holly	Private Citizen of Sanible	boatclub411@gmail.com	(239) 707-9800	
122	Smith, Jennifer	Lee County Florida Health	Jennifer.Smith3@flhealth.gov	(850) 631-1271	
123	Smith, Stephen	ARES/RACES	W9GPI@ARRL.net	(920) 251-6249	
124	Solich, John	Lee County DOT Operations	jsolich@leegov.com	(239) 533-9400	
125	Southall, Robert	Lee County Transit	rsouthall@leegov.com	(239) 533-0363	
126	Spearo, Jesse	Cape Coral Emergency Management	jspearo@capecoral.net	(239) 242-3611	

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	A	B	SIGN IN SHEET for 1/27/2017	D	E
2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
127	Stead, Ken		ken@swfmia.com		
128	Stelmacki, Sonny	Lee County School Dist.	Sonnyas@leeschools.net		
129	Stewart, Bob retired	Lee County Building Services	Rstewart@leegov.com	(239) 533-8320	
130	Tapfumaneyi, Sandra	Lee County Emergency Mgmt	stapfumaneyi@leegov.com	(239) 533-0614	
131	Thompson, Richard	City of Fort Myers	rthompson@cityftmyers.com	(239) 321-7630	
132	Tomlinson, Bill	City of Sanibel Police Dept.	Bill.tomlinson@ci.sanibel.fl.us	(239) 472-3111	
133	Trescott, Dan	SW FL Regional Planning Council	DTrescott@swfrpc.org	(239) 338-2550 x220	
134	Vance, Audrey	City of Bonita Springs	audrey.vance@cityofbonitasprings.org		
135	Vanderbrook, Scott	Estero Fire Dept.	vanderbrook@esterofire.org	(239) 390-8000	
136	Vidal, Denis	LCEC	denise.vidal@lcec.net		
137	Wade, Doug	Lee Memorial	dwade@leememorial.org		
138	Weis, Dan	Construction and Design	dweis@leegov.com	(239) 707-6719	
139	Walker, Tim	SWFL Regional Planning Council	twalker@swfrpc.org	(239) 338-2550	
140	Wheaton, Patti	Medical Examiners Office, Lee County	Pwheaton@leegov.com	(239) 277-5020	
141	~~Will, Megan~~ no longer here	Town of Fort Myers Beach	Megan@FortMyersBeachFL.gov	(239) 765-0202	
142	Wilson, Hans	SW FL Marine Industries Association	hans@hanswilson.com	(239) 656-7083	
	Stewart, Kara	FMB	Kara@fortmyersbeachfl.gov	2397704198	
	O'Riley, Chelsea	FMB	Chelsea@fortmyersbeachfl.gov	239 765 0202 ext. 170	
	Jackson, Meischa	CCEM	MKjackson@capecoral.net		
	Doug Burgess	Lee County DOT/EM	dburgess@leegov.com	533-8400	

Meeting Minutes

DISASTER ADVISORY COUNCIL

Joint Unified Local Mitigation Strategy Update Project

LMS WORKING GROUP MEETING #3

January 27, 2017

Beals, Nathan - Lee County Utilities

Bjostad, James – Lee County Emergency Management

Bridges, Sandi – Lee County Emergency Management

Brown, Pam - Visitors Convention Bureau

Busbee, Doug – Lee County Department of Transportation

Campbell, Gerald – Florida Gulf Coast University

Carter, Cindy – Lee County Parks & Recreation

Dalton, William – Sanibel Police Department

Daltry, Wyatt – City of Cape Coral

Danner, Lisa – Hagerty Consulting

Davis, Jenny - Lee County Public Safety

Fenske, Jennifer – Lee County Public Safety

Fournier, Celeste - Lee County Emergency Management

Gooderham, Kate - Gooderham & Associates

Jackson, Meischa - Cape Coral Emergency Management

Jacoby, Billie – Lee County Community Development

LaGuardia, Joan – Lee County Admin

Larsen, Sandy – City of Sanibel

Le-Blanc-Hutchings, Lisa – Lee County Port Authority

Mayfield, Lee - Lee County Emergency Management

Nadler, Kristi - Lee County Emergency Management

O'Riley, Chelsea - Fort Myers Beach

Parry, Gisele – Hagerty Consulting

Quimby, Debbie - Lee County Emergency Management

Stewart, Kara - Fort Myers Beach

Thompson, Richard – City of Fort Myers

Vanderbrook, Scott – Estero Fire Department

Walker, Tim – SWFL Regional Planning Council

Zambito, Chris – Dewberry

Agenda Items

- Welcome and Introductions
- Project Meeting
    - Core Hazards List
    - Risk Assessment Results
    - LMS Project/Strategies Discussion
    - Project Timeline
    - Next Steps
- Questions
- Final Comments/Adjourn

Lee Mayfield, Emergency Planning Manager opened the meeting at 2:05 am on 1/27/17.

Minute Approvals

Motion to approve meeting minutes from 12/13/16 made by William Dalton, Seconded by Jennifer Fenske. All in favor.

Welcome and Introduction - Lee Mayfield

Thanks everyone for joining us and we are seeing the light at the end of the tunnel with this Local Mitigation Strategy finally. We have the rest of the month of February to review the draft that will be provided to us in the next week or so. We will send the draft out to the email list to everyone probably next week. We are going to talk about the risk assessment here today, talk about the core hazards and all the number crunching they did from our last meeting. Second part of the meeting we will be going through a list of Mitigation Projects. This is all the stuff we have been talking about which has led to you guys getting with your county or city leadership and talking about these projects that we want to have included in this plan. We will be going through the projects and don't' worry we will have one more meeting in February where Bonita Springs, Cape Coral, Estero and the unincorporated Lee County projects will be flushed out and edited a little bit. We have packets printed out that have all the scoring sheets for these projects and we will go through them and let the presenters discuss the projects and then ask if anyone has any questions on the scoring sheet. Don't get too wrapped up on the exact scoring for these projects. As you know the current project list has over hundred projects on it, so all those scores are going to be very close together. The key is that when we have funding available after a disaster we come back to meet and then based on the amount of money we get we will talk about reorganizing the list and what projects we want to actually put into applications to get any funding. The good news item is that after the two hurricanes this past year, Hermine and Matthew there is currently funding out there, so those notices went out this past week for Hermine and one for Matthew is coming out in the next couple weeks hopefully. That doesn't mean we have necessarily a lot of mitigation money to play with, but if the impacted counties don't spend their money then we access to some of that. The first step is getting the projects on the list.

Lisa Danner - Hagerty Consulting

As Lee was saying we are going to spend a little time for the agenda looking at the draft risk assessment. The findings the rankings with regards to that and then the majority or bulk of the meeting will be on the LMS projects and strategies discussion. Then we will talk a little about the timeline and what the next steps we have to finish up. I'm very surprised with the turn out for a Friday afternoon, so thank you for being here. We appreciate your time today. I'm going to turn it over to Chris from the Dewberry group that led the effort with regards to the Hazard Identification Risk Assessment (HIRA) portion of this. If you have any questions please let us know.

Chris Zambito - Dewberry

Good afternoon everyone, we're almost done, almost to the weekend. Just want to walk you through a little bit here with what we came up with. This chart is what we discussed at the last meeting with the core hazards. This is looking at how different metrics were assessed and how they came out overall. It shows more or less the high impact versus the low impact hazards. From the State FEMA prospective there is no right or wrong way to do this, it's just however, you guys decide to do it. The methodology just needs to be documented. For this assessment your high hazards are flooding, hurricane wind, thunderstorm lightning wind and tornados. Probably a lot of that is because there were deaths associated with those types of hazards in the past. Your medium is storm surge, wildfire, aircraft to some extent, and epidemic disease. This is the way it came out and if for some reason you want to make any adjustments we can make changes. Are there any questions in general about the ranking process or anything unexpected or concerning about the data?

Lee Mayfield – Can you talk a little about the data where it came from and how you guys came about it?

Chris Zambito - A lot of literature and research for most of it was used. It used to be called the National Climatic Data Center (NCDC), but has a new name now. Its name now is National Centers for Environmental Information (NCEI) it's a National weather service type data that gets fed into that so your local data comes from national weather service and into that. Also, a lot of just going through the internet for airplane crashes and things like that. In the Hazard Identification Risk Assessment (HIRA) itself we document the data sources that were used. The biggest one is the local data that we have researched as well as the national data. Every hazard here has a profile for every hazard and a description of that hazard and where in the county that it impacts you and what is the magnitude of that hazard. We have documentation of all the previous occurrences and we will probably look at the probability of what is happening in the future and then the vulnerability and risk get broken down into what you saw on the screen previously. Looking at some metrics and how that particular hazard falls out relative to the others and then we start looking at how many buildings, how many people; those type of things. For every hazard you will have something like that, so this is the draft copy of the table of contents for this particular part. You have 115 pages right now of data for 15 or 20 hazards. We will talk at the end. There are a couple, that if you guys have additional data that you want to put in, and it could enhance some of the local data we will request that at the end. So for every hazard that you come across on the document we will have a map of where it is occurring. Certain hazards you will have it by the category of the hazard; like a hundred year versus a five hundred year for tornados. The flood is normally a bigger one that has more in depth information about it because it's so well documented and it's looking at your flood insurance policy information. You guys have a very good program for public information which is part of your CRS. This was done last year and was looking at your January statistics flood insurance so this is just about as update as you can get it. One of the things we wanted to do here was to look at the building footprint level the best we could get an idea of what the impact was and give maps that have hot spots shown. This is just another way to look at where your exposure is as far as this case it's a hundred year versus five hundred flood zones. This process is a fairly new thing and we have been showing FEMA it's a different way to go about looking at the data at a different level.

Kate Gooderham – On the last slide…Are those numbers the value of the entire structure or the value of the structure that would be insured? Okay, so these are substantially higher than what anybody would ever get. In some areas like you might get 10%. I just think this is important for us to realize that these numbers are much lower.

Chris Zambito – It is the total structure. Correct, yes, just thing about it from the FEMA prospective if you're getting $250,000 in coverage and your structure is a million dollars.

This graphic is looking basically at tornados and the different scaling of the intensity. Lee asked us to give you an overview of graphics, maps and documents so you can look at the history. A lot of the data collected is based on the frequency or how the metrics played out.

Lee Mayfield – On the core hazard list one of the things we will go back and forth on is the storm surge versus hurricane wind. It all depends on what your perspective is with the probability of storm surge is low here. Overall it's probably true and we haven't had any significant storm surge events that go far inland. We are so focused on the worst case, so we talk about that a lot, but death and injury would be extremely high if we were to have a large surge event.

Chris Zambito - Historically, this has not happened and most of the data goes back to the 1950's.

Gerald Campbell – If you go back the least point you have an initial slide where it shows comparisons and shows hurricane winds are overall related a medium hazard where storm surge is rated low. Wind is rated higher than surge and that to anyone looking at it will see that wind will be the worry because it rates higher. Regardless of how the metrics work out I think there has to be a way to override or explain that.

Chris Zambito - If you think we should go back and tweak the numbers to come out different, we can do that. We just need to document and FEMA just needs to know that we have gone through the planning process.

Kristi Nadler - I don't see where environment factors are listed into this. (Mangroves, Eco services)

Chris Zambito – Environment per say is not weighed into this, and that is just because when you're looking at NCI data there is nothing on the environment perspective that is there. Nothing that is really captured when they are reporting losses, however it is a good metric that should be captured better, but it's not now.

Kate Gooderham – Can we look at the wildfire graphic—I think it shows a lot of fire. On one hand we have the tornado map that shows past tornado and wildfire that is based on what might burn under different circumstances. I would like to see a fire map of what we have burned because we should have pretty good data on that. We have a lot of fire departments and equipment out there to go and put out fires, but it's the ones on the very edges we have had trouble dealing with.

Chris Zambito – Think of it more of not fires that are going to happen, but relative to its surrounding environment these are the areas that are more susceptible to having more damage from a lot of fire if it was to occur. This is from the southern risk assessment portal from their wild land urban that shows vulnerability risks. For tornado we are showing past occurrences and for wild land urban we are showing what are more vulnerable.

Scott Vanderbrook – Since I'm on the fire side and my prospective could be totally wrong, but the red dots indicate where there could be massive loss because it's interfaced not actually where we've had fires. If you go outside the village of Estero where it's all white there are hardly any homes out there, so we could have a hundred of acres where there is no massive loss to that.

Chris Zambito – Do you have data that we could utilize from past events?

Scott Vanderbrook – We do. It's probably just more knowledge of knowing and being in the area for 20 years.

Pam Brown – I get this map is the value of the buildings and structure, but how does this help us? I would think a good portion of this Fort Myers before you go over the bridge to Sanibel I've lived here for almost 30 years and I don't recall a wildfire in that section. Yet this is where all the red and orange seem to be logging on top of my house. With all the housing developments and neighbors who complain about the foliage and making sure we have all the dead stuff taken care of that to me should mean mitigation in that area, so what's the bad news? As we assess and score these exercises according to wildfire what would we use to make sure we are making the right decision based on the information we have?

Chris Zambito – This is just showing you relative to each other where there is high potential of something that happened in that area. You may want to increase water pressure to these partial areas, or do a tree trimming cycle. Sometimes this is just what the vulnerability is whether or not you've seen any damage from it. It may or may not happen. Here's one of the tricky parts of mitigation if you're looking at it on a hazard by hazard basis you can sometimes do mitigation. Wildfire is a good example where from a wildfire protections they will say don't have the landscape foliage right next to the house, but if we put the tree over here it's more likely to get hit from the wind. Sometimes the hazards will compete against themselves as far as you

do mitigation. Now in some of these areas you may want to change the type of roofing material or something like that. Each hazard has its own ways you can mitigate relative to itself.

Scott Vanderbrook – Looking at the flooding map-from my prospective of the fire side you see a lot of flooding on I-75 potentially but not so much over the bay so I view this map as a low laying area that doesn't have proper drainage and funds should be spent to make sure that area is mitigated over future floods. Am I reading that right?

Chris Zambito – Yes, remember too this is looking at where there are flood plains, so it's not the main roads. Each hazard will have one to four different maps for the different items.

Pam Brown – Coming from a tourism perspective on this. As Gerald said in Hendry County if there in the corner where there are lots of trees and brush that's going to catch fire burning out of control, and the fire guys are out there putting fires out. Meanwhile what if an incident would occur for our tourist, visitors, snowbirds where they would be needed?

Scott Vanderbrook – I know what you're trying to say-if there is a large incident is there enough to cover? Yes, there is. We have that taken care of state wide where we would pull resources from all over the state.

Chris Zambito – Unfortunately, you are vulnerable to a lot of hazards, so you are never going to be able to protect yourself from everything. The last thing I want to cover here is flooding. Is there anything beyond what they are going to say on the map as a vulnerability if there is a certain pocket that you have to respond to that maybe your storm water is insufficient or something like that in the map; please provide it to us. We also, talked about the CRS about repetitive loss for the municipalities. We got data from the unincorporated, but not from the municipality. We have a couple manmade here, so from the state and FEMA perspective of valuating the mitigation plan this is all bogus to them, they are not going to do this. We have somewhat limited data for cyber, airport crashes, so if you guys have any local data or from the cyber perspective that you have done on your own, any training programs that would be beneficial to include in here. These are just a couple items that we think could be improved a little bit more if we have more data.

Lee Mayfield – The response plan do you incorporate with the plans in the document or do you reference them?

Chris Zambito – We do if you want us to, if there is something that should be secure we don't, but if you'd like we can do that. Just helps to get information on some of these things, sometimes it's just national data we have. If you have information that you want to include, please provide it. So from the higher perspective we are done, but there is a draft that will be floating around. Evaluate the draft and if you have any concerns, please mark it up. Lee will document into one for us to look at, and we will be done at that point.

Lee Mayfield – We will send out the whole document next week and if you have any comments on your hazards, please do so.

Lisa Danner - Hagerty Consulting

For the plan review as Lee was saying sometime next week you will be getting a copy of the updated LMS document. The HIRA is part of that updated plan, so we are thinking we will get it out next week to give you a couple of weeks to take a look at it, provide feedback to us on the document and then end of February we are looking at doing a final meeting before the plan is submitted to the state for approval. We might want to look at some dates towards the end of the month with regards to doing a final meeting. Basically, that final meeting will be answering any questions and reviewing your comments that the group needs to reach a consensus on with regards to the plan we will do that. Pretty much just a final meeting before the plan has to be submitted to the state.

Lee Mayfield – I'll send out a doodle poll to you guys to see which date gets the most votes for the next meeting.

LMS Projects/Strategies Discussion – Lee Mayfield

In looking at the old LMS list we sat down and went through the list and found about 80% of the projects were completed and done. There are 170 projects on the project list between 6 municipalities and unincorporated Lee County. I have transposed the current list so these are some projects that we have on here, made some notes and we will leave these on, but just mark them as completed. We will just go through the list and add new projects.

The city or individuals who present these projects have already gone and done the hard work for us, and has given us their best estimates and judgments and scored these projects on the work they have done with their folks at the city. There is one that we will discuss here for each project which is the Level of Public Demand on the second page at the bottom. Don't get too wrapped up around the axles on the ultimate scoring at the end I think it's something we can discuss moving forward and how we want to officially rank these projects if there is money that coming down. A lot of these projects may not be eligible for hazard mitigation grant program funding, but it still is good to have on the list, so you can justify to your leadership or elected officials that it was part of the formal planning process and was discussed throughout the county. This plan can be used as a little bit of leverage. We will go through the projects and give everyone a few minutes to flip through each project and see if there are any questions or comments.

Fort Myers Beach - Presenters: Kara Steward & Chelsea O'Riley - Basically we are looking at replacing our water lines and trying to kill two birds with one stone instead of tearing the road up twice and doing storm water at the same time. The town owns side streets county owns Estero and we are going through and doing the side streets to accommodate the salt water drainage. All 5 of these projects, basically cover and pertain to the same thing.

Kate Gooderham – Can we have a one sentence description listed? We could look at these as a whole together.

Lee Mayfield – Good point. I think these scores were all relatively close, so there's not a big difference in them. I would assume the level of demand would be similar for all of them.

Kate Gooderham - Discussed throwing out a Score of 3 on all projects. MOTION, to add project to the LMS list with a score of 3 for Public Demand, Seconded by William Dalton.

Joan LaGuardia – With more conversations on these projects and drainage related items I see that we need to score Fort Myers Beach projects higher. Joan LaGuardia MOTIONS to change the project to a score of 4, for Public Demand and add it to the LMS list, Seconded by William Dalton.

New Project	Level of Public Demand, County Wide (Select this score with the LMS Group) Score
Mid-Island Neighborhood Drainage Improvement Segment 1 - $6,600,000	**Score 4 = Very High interest and public support** Joan LaGuardia MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by William Dalton. All in favor.
Mid-Island Neighborhood Drainage Improvement Segment 2 - $7,900,000	**Score 4 = Very High interest and public support** Joan LaGuardia MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by William Dalton. All in favor.
Mid-Island Neighborhood Drainage Improvement Segment 3 - $7,400,000	**Score 4 = Very High interest and public support** Joan LaGuardia MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by William Dalton. All in favor.

South End Neighborhoods Drainage Improvement - $3,400,000	**Score 4 = Very High interest and public support** Joan LaGuardia MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by William Dalton. All in favor.
North Estero Drainage Improvement Phase IIB - $2,600,000	**Score 4 = Very High interest and public support** Joan LaGuardia MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by William Dalton. All in favor.

Sanibel - Presenters: William Dalton & Sandy Larsen – 1) Beach Renourishment – This covers three specific areas. We are covering hot spots areas, one is Lighthouse Beach we have a road that goes to the parking lot and has washed out probably 4 to 6 times in the last 8 months. If you look at an aerial from 50 yrs ago there used to be a road that goes up to it and literally half of that property is no longer there anymore. There is a bay area on the island area too.

Kate Gooderham – Captiva is one of your hot spots and that is hurricane evacuation. 2) Sanibel Slough System - Sanibel has one major drainage system and we have been working on replacing the Stormwater management plan, which covers 75% of the population on the island. 3) Living Shoreline – We have several areas on the island that we are having erosion projects for shoreline and natural methods to combat. They have tried to plant mangroves and they just washed right away; so it's a combo of trying to harden the natural structure and the shoreland. 4) Tahiti/Jamaica Area Drainage Improvements – One of the recovery worst interior rain flooding. This one is head waters of our Sanibel Slough System, so probably was the slowest to drain out but the sub-division is from the 1920's.

New Project	**Level of Public Demand, County Wide** **(Select this score with the LMS Group)** **Score**
Beach Renourishment - $14,000,000	**Score 3 = High interest and public support** Lee Mayfield MOTIONS to add project to the LMS list with a score of 3 for Public Demand, Seconded by William Dalton. All in favor.
Dredging and restoration of the Sanibel Slough System - $500,000	**Score 4 = Very High interest and public support** Joan LaGuardia MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by William Dalton. All in favor.
Living Shoreline Projects - $388,000	**Score 2 = Moderate interest and public support** Kate Gooderham MOTIONS to add project to the LMS list with a score of 2 for Public Demand, Seconded by Richard Thompson. All in favor.
Tahiti/Jamaica Area Drainage Improvements - $560,000	**Score 1 = Low interest and public support** Lee Mayfield MOTIONS to add project to the LMS list with a score of 1 for Public Demand, Seconded by Chelsea O'Riley.

	All in favor.

Fort Myers - Presenter: Richard Thompson – Lee will be going back to work with them on the cost benefit analysis since that part is not filled in right now. Wanted to at least socialize these projects and make sure everyone hears about them and will talk about public demand and vote. We will come back and put them on the list when we have a full score.

New Project	Level of Public Demand, County Wide (Select this score with the LMS Group) Score
Billy Creek Restoration - $800,000	**Score 3 = High interest and public support** William Dalton MOTIONS to add project to the LMS list with a score of 3 for Public Demand, Seconded by Chelsea O'Riley. All in favor.
Caloosahatchee Shoreline Protection - $1,000,000	**Score 3 = High interest and public support** William Dalton MOTIONS to add project to the LMS list with a score of 3 for Public Demand, Seconded by Wyatt Daltry. All in favor.
Citywide Canal Armoring - $900,000	**Score 4 = Very High interest and public support** Joan LaGuardia MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by Chelsea O'Riley. All in favor.
Citywide Lake Rehabilitation - $850,000	**Score 2 = Moderate interest and public support** Kara Stewart MOTIONS to add project to the LMS list with a score of 2 for Public Demand, Seconded by Jennifer Fenske. All in favor.
Edgewood Neighborhood SWM System Flood Protection - $1,600,000	**Score 4 = Very High interest and public support** William Dalton MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by Tim Walker. All in favor.
Ridgewood Park Neighborhood SWM System Flood Protection - $1,250,000	**Score 4 = Very High interest and public support** William Dalton MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by Tim Walker. All in favor.

Adjourn

Motion to adjourn made by William Dalton, Seconded by Jennifer Fenske. Meeting adjourned at 3:47 pm

March 8, 2017

Public Notice

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PUBLIC NOTICE
County's Local Mitigation Strategy Update

PLEASE BE ADVISED that Lee County Emergency Management will hold a public meeting where concerns and comments will be heard in order to update the County's Local Mitigation Strategy. The meeting will be held on Wednesday, March 8th, 2017 from 2:00pm – 4:30pm at the Lee County Emergency Operations Center – 2675 Ortiz Ave Fort Myers, FL 33905.

The Local Mitigation Strategy (LMS) establishes a plan to make the County safer from a variety of hazards and to reduce long term deaths and property damage. Federal rules require that local governments maintain a Local Mitigation Strategy to receive several types of disaster related assistance grants. Public comment is a federal requirement for plan approval.

Lee County Emergency Management encourages the public to view the current version of the plan at the website: https://www.leegov.com/publicsafety/emergencymanagement/plan/mitigation

Comments on the plan can be directed to: Lee Mayfield, Lee County Public Safety/Emergency Management, 239-533-0622, lmayfield@leegov.com.

Public input in the development of the Local Mitigation Strategy will ensure that the money is spent on mitigation projects that benefit the community most. Lee County Emergency Management needs help in identifying places that are at risk to hazards and projects that could be carried out to mitigate the hazards. Hazard mitigation actions include: prevention, property protection, public education, natural resource protection, emergency services protection and structural projects. Lee County Emergency Management is looking for mitigation project ideas.

In accordance with the Americans with Disabilities Act, Lee County will not discriminate against qualified individuals with disabilities in its services, programs, or activities. To request an auxiliary aid or service for effective communication or a reasonable modification to participate, contact Joan LaGuardia, (239) 533-2314, Florida Relay Service 711, or jlaguardia@leegov.com. Accommodation will be provided at no cost to the requestor. Requests should be made 48 hours in advance.

PO: Westen #L030117-46

AD# 1944376 3/1/2017

Sign-In Sheet

	A	B	SIGN IN SHEET for 3/8/2017	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
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4	Ahmadi, Kevin		kevina@gulfcoastvillage.org		
5	Barden, Jack	Equal Opportunity Analyst	jbarden@leegov.com	(239) 533-2201	
6	Beals, Nathan	Lee County Utilities	nbeals@leegov.com	(239) 533-8157	
7	Benacquisto, Senator Lizbeth		benacquisto.lizbeth.web@flsenate.gov		
8	Bjostad, James	Lee County Emergency Mgmt	jbjostad@leegov.com	(239) 533-0617	
9	Bowen, Trenton Chief	City of Fort Myers Fire Dept.	Tbowen@cityftmyers.com	(239) 321-7311	
10	Brady, Christine	Lee County Human Resources Director	cbrady@leegov.com	(239) 533-2348	
11	Bridges, Sandi	Lee County Emergency Mgmt	sbridges@leegov.com	(239) 533-0615	
12	Brown, Pam	Visitors Bureau / Conference & Event Manager	pbrown@leegov.com	(239) 338-3500	
13	Busbee, Doug	Lee County Dept. of Transportation	dbusbee@leegov.com	(239) 533-9400	
14	Cain, John	American Red Cross	disaster@arclee.org	(239) 278-3401	
15	Campbell, Chris	City of Bonita Springs	Christopher.Campbell@cityofbonitasprings.org		
16	Campbell, Gerald	Emergency Manager - FGCU	gcampbell@fgcu.edu	(239) 590-1948	
17	Carter, Cindy	Lee County Parks & Recreation	ccarter@gmail.com	(239) 229-0493	
18	Carter, Linda	No Person Left Behind	mslindacarter@gmail.com	(239) 368-6846	
19	Cassidy, Frank	City of Bonita Springs	frank.cassidy@cityof bonitasprings.org	(239) 949-6257	
20	Cloutier, Peter	Internal Services / Mgr. Internal Serv. - Fiscal	pcloutier@leegov.com	(239) 533-8512	
21	Cochran, Don Chief	City of Cape Coral Fire Department	dcochran@capecoral.net		
22	Coleman, Kyle	Village of Estero	coleman@estero-fl.gov	(239) 221-5035	
23	Crawford, David		dcrawford@swfrpc.org		
24	Crisafulli, Susan	LCEC	susan.crisafulli@lcec.net	(239) 656-2399	
25	Dalton, Lt. William	Sanibel Police Department	bill.dalton@mysanibel.com	(239) 472-3111	
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27	Danner, Lisa	Hagerty Consulting	lisa.danner@hagertyconsulting.com	(423) 727-9058	
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29	Deerey, Aaron	Lee County Port Authority	amdeerey@flylcpa.com	(239) 590-4696	
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31	Dobson, Kenny	School District of Lee County	KennethDD@leeschools.net	(239)0839-9083	
32	Doggett, Linda	Lee Clerk of Courts	ldoggett@leeclerk.org	(239) 533-2554	
33	Donley, Liz	Charlotte Harbor National Estuary Program	ldonley@chnep.org		

	A	B	SIGN IN SHEET for 3/8/2017	D	E
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34	Drake, Dylan	Lee County Human Resources	Draked@leegov.com	(239) 533-2005	
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43	Fournier, Celeste	Lee County Emergency Mgmt	cfournier@leegov.com	(239) 533-0694	
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57	Harris, David	Budget Services / Manager, Budget Services	dharris@leegov.com	(239) 533-2301	
58	Hartwell, Judy	City of Fort Myers Fire Dept.	jhartwell@cityftmyers.com	(239) 321-7321	
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	A	B	SIGN IN SHEET for 3/8/2017	D	E
2	**Attendees**	**Agency**	**Email Addresses**	**Office Phone #**	**Signature**
64	Higgins, Douglas	Lee County Public Safety	dhiggins@leegov.com	(239) 533-3916	
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83	Lassiter, Trish	LCEC	Trish.Lassiter@lcec.net	(239) 292-3143	
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88	Loveland, David	Lee County Dept. of Transportation	Loveladm@leegov.com	(239) 478-8509	
89	Lucia, Scott Captain	Lee County Sheriff's Dept.	SLucia@Sheriffleefl.org	(239) 477-1086	
90	Mallow, Terry	Lee Clerk of Courts	tmallow@leeclerk.org	(239) 533-2184	
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95	Mercado, Roger	Lee County Human Services	rmercado@leegov.com	(239) 533-7930	

	A	B	SIGN IN SHEET for 3/8/2017	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
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98	Miller, Rita	Lee Clerk of Courts	rmiller@leeclerk.org		
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100	Murphy, Gerald	Murphy Planning	jerry@murphyplanning .com	(239) 322-8510	
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	A	B	SIGN IN SHEET for 3/8/2017	D	E
2	Attendees	Agency	Email Addresses	Office Phone #	Signature
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133	Tomlinson, Bill	City of Sanibel Police Dept.	Bill.tomlinson@ci.sanibel.fl.us	(239) 472-3111	
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Meeting Minutes

DISASTER ADVISORY COUNCIL
Joint Unified Local Mitigation Strategy Update Project
LMS WORKING GROUP MEETING #4
March 8, 2017

Beals, Nathan - Lee County Utilities
Bjostad, James – Lee County Emergency Management
Bridges, Sandi – Lee County Emergency Management
Brown, Pam - Visitors Convention Bureau
Busbee, Doug – Lee County Department of Transportation
Campbell, Gerald – Florida Gulf Coast University
Carter, Cindy – Lee County Parks & Recreation
Carter, Linda – No Person Left Behind
Cassidy, Frank – City of Bonita Springs
Daltry, Wyatt – City of Cape Coral
Danner, Lisa – Hagerty Consulting
Davis, Jenny - Lee County Public Safety
Eck, Caitlyn – Lee County Health Department
Fournier, Celeste - Lee County Emergency Management
Gooderham, Kate - Gooderham & Associates
Grumney, Dave – Lee County Public Safety
Guirguis, Ehab – Lee County DOT
Hartwell, Judy – City of Fort Myers Fire Department
Henninger, Lance – Sanibel Emergency Management
Jacoby, Billie – Lee County Community Development
LaGuardia, Joan – Lee County Admin
Larsen, Sandy – City of Sanibel
Lassiter, Trish - LCEC
Le-Blanc-Hutchings, Lisa – Lee County Port Authority
Mayfield, Lee - Lee County Emergency Management
Muraczewski, Mark – Village of Estero
O'Riley, Chelsea - Fort Myers Beach
Rodgers, Michelle – Lee County Emergency Management
Smith, Jennifer - Lee County Florida Health
Spearo, Jesse – Cape Coral Emergency Management
Stewart, Kara - Fort Myers Beach
Tapfumaneyi,Sandra–Lee County Emergency Management
Thompson, Richard – City of Fort Myers
Vanderbrook, Scott – Estero Fire Department

Agenda Items

- Welcome and Introductions
- Project Meeting
    - Updated LMS Comments/Feedback Discussion
    - Risk Assessment Results
    - LMS Project/Strategies Discussion
    - Next Steps
- Questions
- Final Comments/Adjourn

Lee Mayfield, Emergency Planning Manager opened the meeting at 2:03 pm on 3/8/17.

Minute Approvals

Motion to approve meeting minutes from 1/27/17 made by Rob Farmer, Seconded by Linda Carter. All in favor.

Welcome and Introduction - Lee Mayfield

Welcome everyone and thanks for joining us. This is officially what's called the home stretch of this big local mitigation planning effort. I still have a few of you that I'm trying to track down, so expect some phone calls in the next week or so. The benefit of this is that we did start early, so we have a little bit of wiggle room which will help. I know Celeste is dealing with the Comprehensive Emergency Management Plan (CEMP) as well, so we can wrap up all the loose ends. We are getting there and we are about 85% done. We have a good draft that Lisa with Hagerty will talk about here shortly. I know I promised one more meeting for the last three meetings I believe, but we probably will have to get the group together one more time to very briefly add some new strategies and new projects from Mr. Spearo with Cape Coral. We have a few little things we want to tighten up in Estero with some county projects from DOT and Natural Resources. We are close, very close and I appreciate everyone's hard work getting me those scoring sheets. One of the things we want to do in the next year or so is to reevaluate the process and look at what we are doing as far as putting these projects on the list goes. We still have deadlines to hit, so we will definitely meet those and will talk about timeframe at the end. I'm going to turn it over to Lisa and she will get into the agenda today. We don't have a ton of projects since the meeting last time we went through those projects one by one and we learned our lesson, so we will bundle some of those similar or same flood projects together from Bonita today. Sandi will give us a quick brief on our shelter program and talk about 3 shelters that we want to put on the list; which is really a county wide effort since all of our residents are welcome to our shelters. This is a very common project you see on these mitigation list is the shelter component. We will add those projects and I think we have one piece of old business from Fort Myers their cost benefit bullet that needs to go in and then we will call it a day.

Lisa Danner - Hagerty Consulting

First I would like to say kudos to Lee County because typically we always have a big group like this when you start the process with a client, but usually by what you thought was the last meeting the numbers have really dropped down. Here your numbers have actually increased at this forth meeting to what we had at the first meeting. This says a lot about the program and the interest and what you have vested in this Mitigation Plan. I know Lee and Lee County very much appreciates that, so for today as Lee said we are going to look at and review the draft document that was sent out. We will talk about some of the generality with regards to the feedback and comments, the projects and strategies, the next steps and then the timeline with the submittal of the plan. With regards to the updated plan we took the plan and reformatted it and gave it a new layout to be in concert with a lot of mitigation plans just to make the flow good and easy greeting and also cut down on the size of the document as a whole.

In working through this new update LMS documents we are still working on validating and consensus of comments in the plan itself. We at Hagerty are working with Lee and his team and are looking and getting more information in regards to the comments we have received. If there are comments we need to get validated or a consensus on we are working through them with Lee and his team to get them taken care of.

There were some changes to the Hazard Identification Risk Assessment (HIRA) with regards to the consistency of the terminology for the hazards. We wanted to make it consistent with the Comprehensive Emergency Management Plan (CEMP), and the Emergency Management Accreditation Program (EMAP) compliance for the county. In the nation there is program (EMAP) that jurisdictions can see accreditation where they have a list of 64 standards that the jurisdictions have to comply with or meet as long as some of those standards have to do with the hazard mitigation plan or your mitigation strategy document. We are working through making sure the plan hits all those marks, so when the county does seek the accreditation that it will hit those marks as it relates to mitigation plan.

As Lee said, we are still working through current strategies that are identified in the document as well as adding new strategies into the document. One of the things you have to do with your mitigation plan your current plan is to look at the complete list of strategies that are in the plan and you have to lay out what or where we are at with those individual strategies. Are there strategies that you are still working on or are they ongoing and are going to be completed in the near future or far future? Are some strategies for whatever reason, either doesn't apply or the county/jurisdiction has a different direction, so maybe they need to be removed? If so, then we would have to indicate that and then we also, have to list any new strategies. We are working through the big list that is in the current plan and incorporating it so that when the plan goes to the state of Florida they can look at the list and say this is where that at with regards to all of the strategies. We also, have to update the funding sources for the strategies and update who is responsible for that strategy as well. One of the things that we learned from FEMA last week is they want to start looking at when you develop these strategy lists that you identify who does that strategy benefit? So, is there a particular group such as your access and functional needs group that it benefits? Is it because it's a wild fire or a forestry strategy? It could benefit for those populations that may be more at a risk for wildfires; so within the plan we have to take a look at that does it benefit the county as a whole. We have to look at the benefits for each of those strategies as well, as when it goes to the state of Florida for review. Florida is the only state in the nation that I've worked with that stamps their approval on the plan, FEMA takes it as face value. You don't have to go through another review process with FEMA like you do typically in other states, which is great. I just got back today the revisions to the hazard identification and risk assessment piece that we made revisions too. We will be incorporating in the next couple of days and then working on those comments and feedback with Lee and his group on the validation and consensus. So far, we have received comments from Emergency Management, Port Authority, Natural Resources, County Administration, Community Development, and Lee County DOT. We are still waiting on feedback from Forestry Service, South Florida Water Management, County Attorney, & Municipalities. Are there any other ones that we need to get that you can think of? Over the course of the next 2 to 3 weeks and the month of March we will be walking through these revisions and one of the things we are going to do is check with the Florida Mitigation folks and may start submitting sections of the plan to them, so they can go ahead and start reviewing. Typically, the review time is 4 to 6 weeks sometimes a little longer may take a couple of months to get reviews back. We are going to work at submitting once we get certain sections ready to go for them to review we can go ahead and send them out to them. We do have the course of the next 2 to 3 weeks to gather more feedback or comments, so please let us know if anyone has anything.

Lee Mayfield – It's kind of a general list, we have gotten some feedback from our jurisdictions or cities here, but I want to do another push to make sure everyone is good with certain sections with the plan that relate to their area. I gave the Forestry Service a pass today since they have been pretty busy down south lately. There are some wildfire components to this plan when it comes to wildfire mitigation, but we will catch up with them soon. We need to make sure there is wildfire mitigation, public information and outreach program listed in the plan and is across the board for everyone.

It turns out that most the projects are all very close in numbers, which I think is the goal especially with these new projects because we haven't updated this list in 5 or 6 years. Once done with this process we will have all our cities promoting their new and improved high priority projects and they will all be on the list and when something happens and we get some money we will be able to edit that list based on the amount of dollars and what our priorities are at that time. I will turn it over to Sandi Bridges who works at our shelter and volunteer shops which both are very challenging. The shelter issue is always a priority for us because it is so critical to shelter people in our county in large hurricanes.

Lee County - Presenter: Sandi Bridges – Overview of our shelter: Southwest Florida and the state of Florida in general is at a shelter deficit, so Lee County falls into that area. We are working to have 10% of our population, we have about 5%. Part of my position is to go through and try to identify new shelter spaces which is very challenging because a lot of our growth goes into areas where we can't put shelters, so the storm surge has a list of major issues on what we decide. Part of what I'm always looking for is either old facilities that maybe were build up to codes where we can modify or retrofit or the new facilities that are coming in. We take into consideration the size and typically stick with high schools because they are larger and have gyms.

We will look at middle schools and elementary schools due to situations, but the idea is to figure out how we can put the most people into a building in the safest area and still figure out how to fund it. Two of the projects are retrofits which will be for existing and one is for one school that hasn't been build yet.

New Project	Level of Public Demand, County Wide (Select this score with the LMS Group) Score
Emergency Shelter Mitigation for future High School Facility (Alva or Gateway Location) Funding is needed to harden high school during construction phase - $1.5 Million	**Score 4 = Very High interest and public support** Lee Mayfield MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by Joan LaGuardia. All in favor.
Lehigh Senior High School Shelter Retrofit - $100,000	**Score 4 = Very High interest and public support** Lee Mayfield MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by Joan LaGuardia. All in favor.
Sunshine Elementary Shelter Retrofit - $350,000	**Score 4 = Very High interest and public support** Lee Mayfield MOTIONS to add project to the LMS list with a score of 4 for Public Demand, Seconded by Joan LaGuardia. All in favor.

City of Bonita Springs - Presenter: Frank Cassidy – Overview: All 5 projects are very closely related to the study that was done on the Spring Creek flood basin and storm water system. Feeding the Spring Creek into the northern section of the City of Bonita Springs going out into Lee County and the Village of Estero. These projects are in need for culverts, drainage and each project will benefit the entire system.

Lee Mayfield - We will not be voting on this today, but wanted you to be aware of these projects. Like Frank said we are still working on some of the numbers. Feel free to take home and read it over. We will come back at the next meeting and finalize the numbers and get the public demand scoring.

New Project	Level of Public Demand, County Wide (Select this score with the LMS Group) Score
Bernwood Business Park Improvements: Culvert at North Branch of Spring Creek and Cattle Crossing at	

South Branch - $750,000.00	
Spring Creek: FPL right of way bridging and pipes on South Branch - $1,500,000.00	
Spring Creek: Culvert at Cedar Creek Drive - $250,000.00	
Spring Creek: Rail Road ROW RCP Replacement pipes from east side to west side ditch running parallel to tracks on North Branch and bridge and pipes on South Branch - $2,500,000.00	
Spring Creek: Milagro Lane Culvert at South Branch - $650,000.00	

Fort Myers – Richard Thompson - Projects from 1/27/17 Meeting

Lee Mayfield - We talked through some of your projects last time, but did not have a cost benefit, so we added them and just recap and add the cost benefit. All the projects were either a 3 or a 4 which is pretty average.

Frank Cassidy MOTIONS to give a cost benefit Score of 3, Seconded by Lee Mayfield. All in favor.

Lee Mayfield – That was very quick and brief, but I wanted to give the other cities or any other jurisdictions an opportunity to talk about any projects. I will be meeting with Lee County DOT folks next week to add their projects. I met with Steve in Natural Resources last week and took care of issues they had. Other than the other groups we are reaching out we are still open to feedback, so please let me know if you have anything.

Timeline: The next meeting dates for the BOCC are early May and mid-May, so we would need to have something in early April to give to our board. The current LMS expires June 19, 2017.

Jesse Spearo – In Cape Coral we are working on a few projects; a couple of retrofits, a new fire station, rebuild of a station, charter school retrofit for a safer fit for space in the event there is a tornado or any other severe weather & some drainage projects and will bring these up at the next meeting.

Celeste Fournier – Without an approved LMS we will not have an approved Comprehensive Emergency Management Plan (CEMP), the large majority of it rides on the fact that the LMS is approved, so I need that to happen by July 1st.

Lee Mayfield – All this stuff is tied together, and this is why we made a big push this year to incorporate all these plans together and not have them done separately. It ties to both plans in both worlds, it ties to the accreditation, ties to CRS, and all of our jurisdictions as well. The goal is to have the plan final in April cause we have to send it through our Board process (blue sheet).

What I will do is to make it easier for you all. We will do a summary sheet for everyone which will lay out a summary of what the plan is, it's components and why we do it, and will send to the cities as well. We have all of March to finish all this up and then April we want to be really close to being done with everything. Not sure if the County necessarily has to adopt first? We will ask that question because once the plan is final and in the pipeline it's not going to change, so who's to say you guys couldn't maybe adopt at the same time or before us. We will ask that question and will get back to everybody.

Fire Support – Sandra Tapfumaneyi

Forest fires in Lehigh, huge fire going on down in Collier County (6500 acres right now) ours only got to about a total of 400 acres of multiple fires. We brought our mobile command bus out and allowed command to run off of our bus. We also, had a reception center for people working in the area to give them a break from the smoke and flames. There were no homes that were loss. Some had caught on fire, but they were able to put them out, so this was very fortunate. We had about 15 people that came to the Evac Center and the Red Cross helped staff that. We had Salvation Army that went out and provided food response for meals and canteen services for the responders throughout the evening. We also, did an alert warning push out to the community.

We utilized our CodeRED system that allows us to do reverse 911 calls into the communities and that worked very well. For the first time we utilized IPAWS (Integrated Public Alert & Warning System) that the system that the allows us to send multiple messages out with one system, so on Sunday we were able to try to do the EAS (Emergency Alert System) which is radio and TV and did go thru. Attempted to send it through the WEA (Wireless Emergency Alert) which would go through to cell phone towers and alert residents in the area. We did learn a very valuable lesson you cannot use a circle to port of the area that you would like to send a wireless emergency alert too. The system goes off of nodes or a point and circles are not points. You can only have 100 nodes and we had 180, so squares and rectangles are good. The test for us was good since thankfully it was on a smaller alert.

We apparently, were the first ones to uncover this error, so for next time we will know exactly how to do it. It took us 18 minutes by the time we stopped to draft the message, get approval and send it out, so pretty good timeframe. It was sent out to 50,000 numbers. The way the system works is if you don't answer the phone then it's like a missed number, so we reached like 17,000

In addition to that Sandi came and opened up the EOC here, so we had a staging area here. Also, thank you Cindy for letting us use the Park Rec Center for the activation center for the middle of the day on Sunday and that worked out great. We fueled trucks on Sunday for all the responders & went back to help on Monday. All in all it was a success & great exercise for us.

Linda Carter – On behalf of the Fire Department and myself as Fire Commissioner we would like to thank you and all the other districts that came out to help us in Lehigh.

Training – Celeste Fournier

Schedule of training---Sign up on SERT TRAC (Hand outs - Instructions on how to register…if need help call)

- L-958 NIMS ICS All Hazards Position Specific Operations Section Chief – March 20th to March 23rd
- L-962 NIMS ICS All Hazards Position Specific Planning Section Chief – April 3rd to April 6th
- G-400 Advanced Incident Command System – June 5th to June 6th
- AWR-148 Crisis Management for School Based Incidents – June 7th
- L-449 Incident Command System (ICS) Curricula Train-the-Trainer – July 31st to August 4th

Adjourn

Motion to adjourn made by Linda Carter, Seconded by Celeste Fournier Meeting adjourned at 2:47 pm

Appendix D: Strategy Adoption Resolutions