

Table 2.167. Stages of Southern Pine Beetle Attack.

Symptom	Stage 1 Fresh attacks	Stage 2 Developing broods	Stage 3 Vacated trees
Foliage	Green	Green; fade to yellow before beetles emerge	Red; needles falling
Pitch tubes	Soft; white to light pink	Hardened; white	Hard; yellow; crumble easily
Checkered beetles	Adults crawling on the bark	Larvae in SPB galleries; pink or red; 1/2 inch long	Larvae and pupae are purple; occur in pockets in the outer bark
Bark	Tight; hard to remove	Loose; peels easily	Very loose; easily removed
Color of wood surface	white, except close to new adult galleries	Light brown with blue or black sections	Dark brown to black; may have sawyer galleries
Exit holes	----	May appear where parent beetles left the tree	Numerous; associated with brood adult emergence
Ambrosia beetle dust	----	White; begins to appear around the base of trees	Abundant at the base of trees

Source: Forest Encyclopedia Network, 2009. <<http://www.forestencyclopedia.net/p/p2901>>

Historical Occurrences of Southern Pine Beetle Infestations

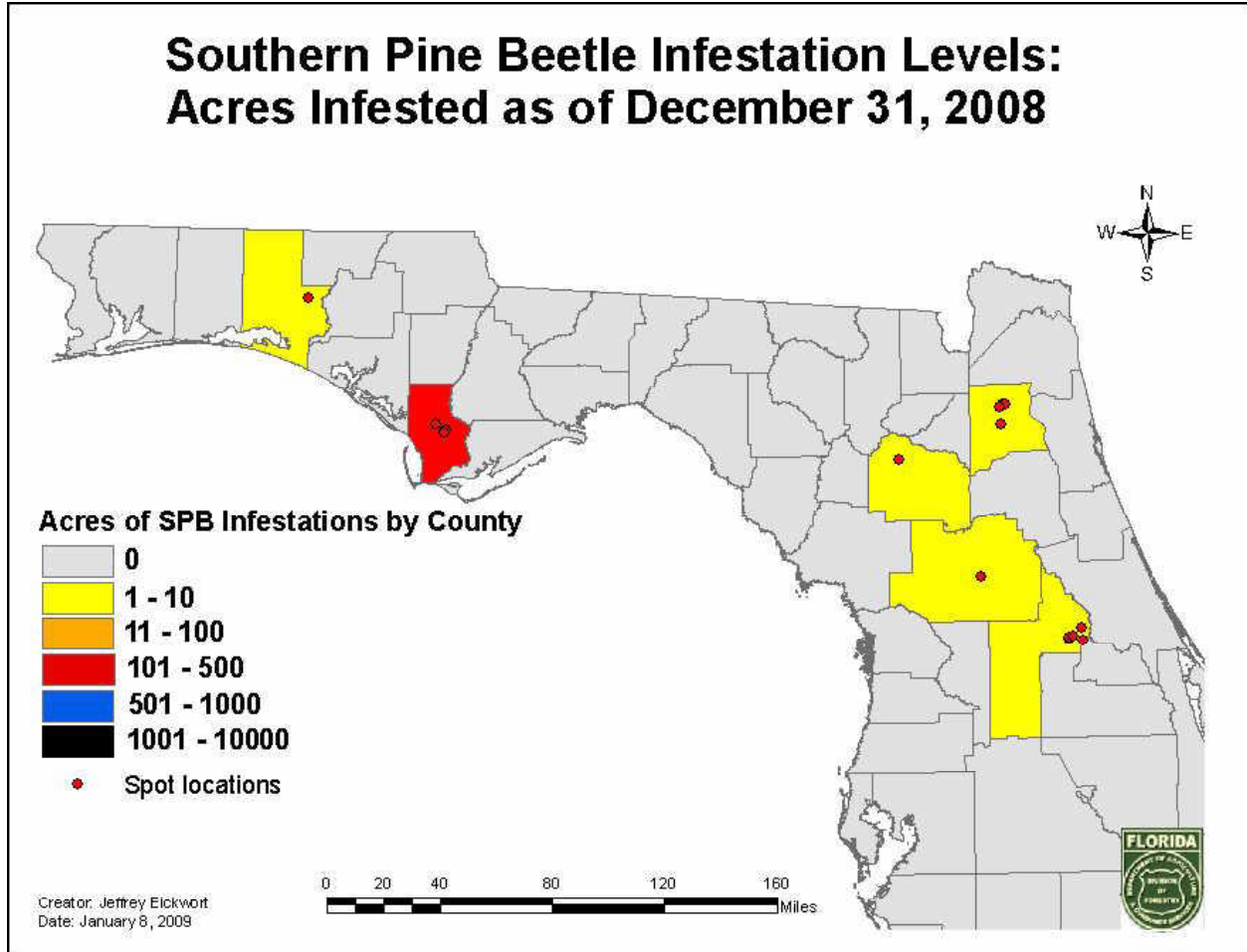
Southern pine beetle infestations have been a widespread occurrence throughout the southeastern United States, including throughout the state of Florida. Millions of dollars worth of lumber have been destroyed in Florida as a result of southern pine beetle infestations. Table 2.168 below describes the historical occurrences of SPB infestations in Florida between 1991 and 2005. The number of acres destroyed by SPB infestations and a valuation of lumber destroyed is also listed for each year in this table.

Table 2.168. Historical Occurrences of Southern Pine Beetle Infestations in Florida, 1991 – 2005.

Year	# Counties with Activity	# Outbreak Counties	# Spots	Acres Affected	Trees Killed	Estimated Pre-salvage Volume Lost (Cu. ft.)	Estimated Pre-salvage Wood Value (\$)
1991	NR	0	NR	NR	NR	NR	\$135,436
1992	1	0	1	60	9,000	215,845	\$245,910
1993	5	0	7	75	11,250	269,806	\$110,858
1994	4	1(a)	343	201	30,150	723,082	\$1,201,425
1995	14	4(b)	718	1,758	526,800	6,648,216	\$12,815,385
1996	5	0	61	278	56,489	936,998	\$1,269,090
1997	16	2(c)	863	7,810	978,354	14,479,118	\$12,753,000
1998	9	0	34	123	22,265	365,845	\$266,466
1999	7	1(d)	220	465	69,800	1,674,000	\$1,627,500
2000	21	4(e)	1,172	6,309	1,261,800	26,245,440	\$15,772,500
2001	34	9(f)	2,892	17,599	3,519,800	73,212,000	\$38,717,800
2002	22	2 (g)	650	2,017	403,400	8,391,000	\$3,025,500
2003	2	0	2	2	450	9,360	\$8,623
2004	1	0	16	~0.5	~50	Negligible	Negligible
2005	3	0	7	15	7359	31,171	\$14,697

However, southern pine beetle infestation in Leon County and throughout Florida have declined in recent years. As displayed in Figure 2.30, there were no reported infestations of southern pine beetles in Leon County in 2008.

Figure 2.30. Southern Pine Beetle Infestation Levels, 2008.

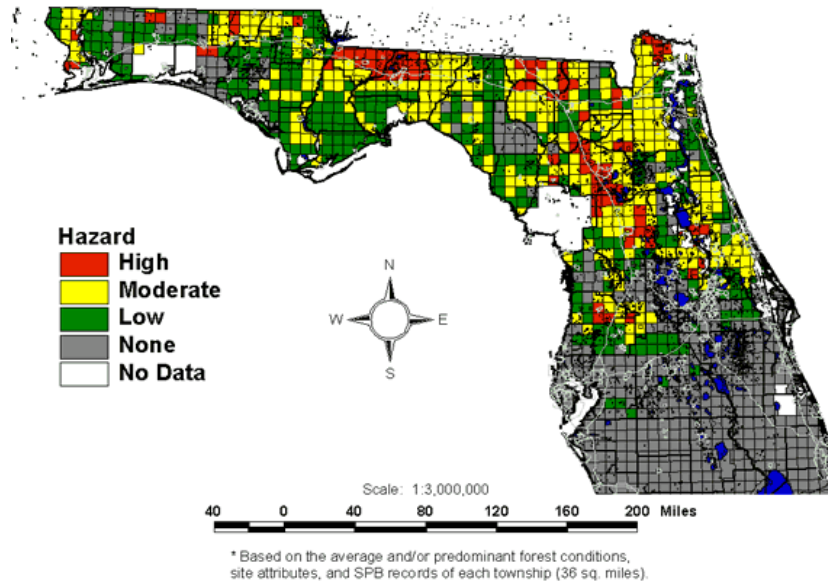


Source: 2008 Southern Pine Beetle Activity Summary, Florida DACS Division of Forestry

Southern Pine Beetle Vulnerability Analysis

Leon County and the City of Tallahassee are considered to be vulnerable to infestation from southern pine beetle, which is exacerbated by drought, particularly during the summer. Leon County is more than 50 percent forested, with increases the risk for SPB infestation. According to the Florida Division of Forestry, the Southern Pine Beetle presents a moderate risk to Leon County. However, the northwestern portion of the county (Lake Jackson basin and Ochlockonee River valley) is at high risk for an area-wide breakout. Figure 2.31 shows the Southern Pine Beetle hazard rating for various parts of Leon County. This is the most current map available depicting Leon County's hazard rating for southern pine beetles.

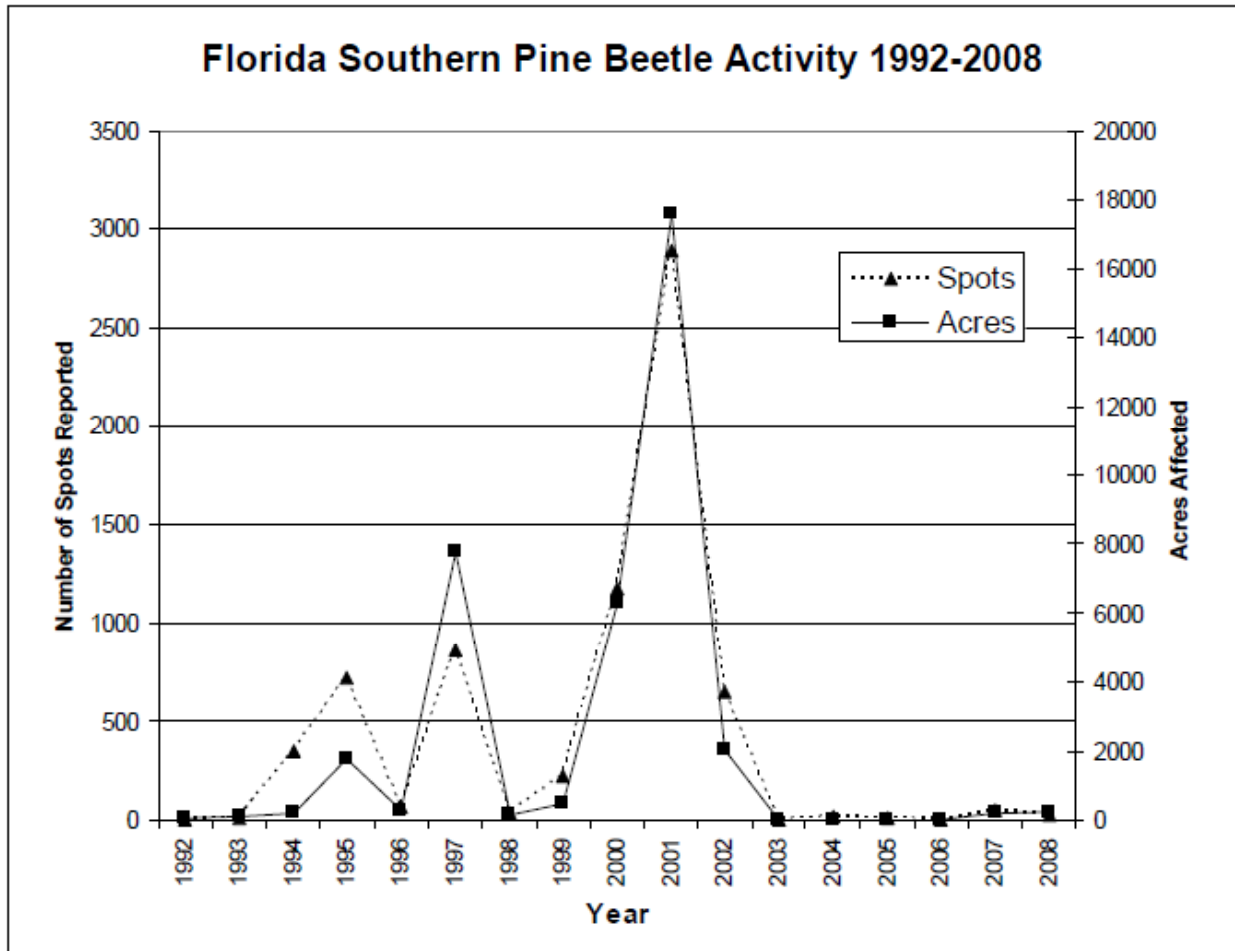
Figure 2.31. Southern Pine Beetle Hazard Rating Map, 2002.



Source: Florida Division of Forestry, 2009
http://www.fl-dof.com/Conservation/forest_health/SPB2002/HazardRatingMap.htm

However, it should be noted that this hazard map was generated during a period of high infestation levels throughout the state of Florida. Since that time, southern pine beetle infestations in Leon County, as well as throughout the state of Florida, have declined dramatically. This is consistent with SPB infestation trends observed by the Florida Division of Forestry. In the past, the Southern Pine Beetle has destroyed portions of the pine forests in Leon County. SPB outbreaks are periodic events that occur roughly on 6-12 year cycles and in general last 2-3 years. Between outbreaks, there can be several years with very few or no infestations, characteristic of the past 6 years in Florida. Figure 2.32 below reflects the trend of southern pine beetle infestations over the last 16 years.

Figure 2.32. Southern Pine Beetle Activity in Florida, 1992 – 2008.



Source: 2008 Southern Pine Beetle Activity Summary, Florida DACS Division of Forestry

Despite the decline in rates of SPB infestations, Leon County is still closely monitoring forestry conditions. Local planning documents, including the Alfred B. Maclay Gardens State Park Unit Management Plan, include procedures for preventing southern pine beetle infestations. Additionally, the Florida DOACS Division of Forestry (DOF) has participated in an annual Southern Pine Beetle (*Dendroctonus frontalis*, or SPB) spring trapping survey since 1995. This survey monitors numbers of adult SPBs and their clerid predators captured in pheromone-baited flight traps during the SPB primary spring dispersal phase. Table 2.169 below describes the results of the spring trapping survey throughout Florida counties for 2007 and 2008. Leon County and the surrounding counties are highlighted, and are all predicted to have a low level of risk for SPB infestations in the coming season.

Table 2.169. Florida Division of Forestry Trapping Survey: Results, Trends and Predictions, 2008.

County	No. of traps	No. of spots 2007							2008 Predictions	
			# of SPB/trap/day			%SPB ^b			Population Trend ^a	Activity Level ^c
			2007	2008	Trend ^a	2007	2008	Trend ^a		
Alachua	3	6	<1	1.4	S	26	50	S	S	Low
Baker	1	0	0	<1	S	0	62	I	S	Low
Bradford	1	0	<1	<1	S	33	33	S	S	Low
Clay	1	0	<1	<1	S	62	44	S	S	Low
Columbia	3	6	<1	<1	S	33	3	S	S	Low
Duval	1	0	<1	3	S	64	63	S	S	Low
Gadsden	2	0	2	<1	S	65	45	S	S	Low
Hamilton	2	3	<1	<1	S	8	10	S	S	Low
Hernando	1	0	<1	0	S	33	0	D	S	Low
Holmes	1	0	0	<1	S	0	2	S	S	Low
Jackson	1	0	<1	1.6	S	5	26	S	S	Low
Jefferson	1	0	<1	<1	S	50	50	S	S	Low
Lake	1	3	<1	0	S	50	0	D	S	Low
Leon	1	0	0	0	S	0	0	S	S	Low
Levy	1	0	0	0	S	0	0	S	S	Low
Madison	1	0	0	1.1	S	0	21	S	S	Low
Marion	3	21	<1	<1	S	44	52	S	S	Low
Nassau	2	0	<1	<1	S	100	75	S	S	Low
Okaloosa	2	0	9	<1	D	22	6	S	S	Low
Orange	1	0	<1	0	S	75	0	D	S	Low
Putnam	1	0	<1	<1	S	33	27	S	S	Low
Seminole	1	1	<1	0	S	0	62	I	S	Low
St. Johns	1	0	0	0	S	0	0	S	S	Low
Suwannee	2	0	<1	<1	S	65	59	S	S	Low
Walton	1	1	0	0	S	0	0	S	S	Low
Washington	1	0	<1	<1	S	19	0	S	S	Low
STATE TOTAL	37	46*	1	<1	S	25	27	S	S	Low

Source: Florida Department of Agriculture and Consumer Services, Division of Forestry, 2008

^a D=Declining, S=Static, I=Increasing. Annual changes of <3 units or <30% were considered 'Static'.

^b %SPB is the ratio of SPBs to the combined clerid-plus-SPB (predator + prey) population, expressed as a percent.

^c Activity level prediction based on model developed by Ron Billings, Texas Forest Service.

2.16 Pandemic Influenza

A pandemic is a global disease outbreak. Pandemics are characterized by three requirements: the virus is new and there is no known immunity. A pandemic is also a highly pathogenic virus that results in illness and death. Lastly, the virus is transmitted person to person and spreads rapidly. Potential impacts of pandemics include increase morbidity (sickness) and mortality (death), social disruption and economic disruption. On average, pandemic influenza incidences occur approximately every 35 years lasting a duration of one to three years. Pandemic influenza is transmitted worldwide in six to nine months, and is typically characterized by one to three waves lasting four to eight weeks per wave. Table 2.170 below describes the stages of pandemic transmittal, as identified by the World Health Organization.

Table 2.170. World Health Organization (WHO) Pandemic Phases.

WHO Pandemic Phases	
	Inter-pandemic Period (new virus in animals, no human cases)
Phase 1	Low risk of human cases
Phase 2	Higher risk of human cases
	Pandemic Alert Period (new virus causes human cases)
↻ Phase 3	No or very limited human-to-human transmission
Phase 4	Evidence of increased human-to-human transmission (<25 cases; small clusters)
Phase 5	Evidence of significant human-to-human transmission (25-50 cases; larger clusters)
	Pandemic Period
Phase 6	Efficient and sustained human-to-human transmission

Considering the potential impacts of a pandemic influenza event on the population are essential for preventive planning, particularly at the community level. Table 2.171 below displays the Pandemic Severity Index (PSI). The Pandemic Severity Index is used to guide local pandemic preparedness efforts based on scenario-based contingency planning. The PSI is a tool, developed by the Center for Disease Control (CDC) for defining which pandemic mitigation strategies are appropriate for implementation based on case fatality ratio, excess death rate, and illness rate caused by the pandemic. PSI category selection is determined by the CDC.

Table 2.171. Pandemic Severity Index, 2007.

Characteristics	Phase 6: Pandemic Severity Index (PSI) for the U.S.				
	Category 1	Category 2	Category 3	Category 4	Category 5
Case Fatality Ratio (percentage)	<0.1	0.1 - <0.5	0.5 - <1.0	1.0 - <2.0	≥2.0
Excess Death Rate (per 100,000)	<30	30 - <150	150 - <300	300 - <600	≥600
Illness Rate (percentage of the population)	20-40	20-40	20-40	20-40	20-40
Potential Number of Deaths* (based on 2006 U.S. population)	<90,000	90,000 - <450,000	450,000 - <900,000	900,000 - <1.8 million	≥1.8 million
20 th Century U.S. Experience	Seasonal Influenza (illness rate 5-20%)	1957, 1968	None	None	1918 Pandemic
* assumes 30% illness rate and unmitigated pandemic without interventions.					

Source: Centers for Disease Control and Prevention, 2007.

Based on PSI category selection by the CDC, local officials are recommended to take the following actions described in Table 2.172.

Table 2.172. Community Strategies by Pandemic Influenza Severity.

Interventions by Setting	Pandemic Severity Index		
	1	2 and 3	4 and 5
Home			
Voluntary isolation of ill at home (adults and children); combine with use of antiviral treatment as available and indicated	Recommend	Recommend	Recommend
Voluntary quarantine of household members in homes with ill persons (adults and children); consider combining with antiviral prophylaxis if effective, feasible, and quantities sufficient	Generally not recommended	Consider	Recommend
School			
Child social distancing dismissal of students from schools and school based activities, and closure of child care programs	Generally not recommended	Consider: ≤ 4 weeks	Recommend: ≤ 12 weeks
reduce out of school contacts and community mixing	Generally not recommended	Consider: ≤ 4 weeks	Recommend: ≤ 12 weeks
Interventions by Setting	Pandemic Severity Index		
	1	2 and 3	4 and 5
Workplace/Community			
Adult social distancing			
–decrease number of social contacts (e.g., encourage teleconferences, alternatives to face to face meetings)	Generally not recommended	Consider	Recommend
–increase distance between persons (e.g., reduce density in public transit, workplace)	Generally not recommended	Consider	Recommend
–modify, postpone, or cancel selected public gatherings to promote social distance (e.g., stadium events, theater performances)	Generally not recommended	Consider	Recommend
–modify workplace schedules and practices (e.g., telework, staggered shifts)	Generally not recommended	Consider	Recommend

Source: Centers for Disease Control and Prevention, 2009. <http://www.cdc.gov/media/pdf/MitigationSlides.pdf>

Historical Occurrences of Pandemic Flu

Yearly, seasonal influenza is responsible for nearly 40,000 deaths nationally, mostly in the elderly and infirm. However, the affects of pandemic influenza are much more severe. Throughout the 20th century, there were three influenza pandemics occurring in 1918, 1957 and 1968. Though estimates vary, the influenza epidemic that swept the world in 1918 is estimated to have killed 50 to 100 million people. The 1918 pandemic, or the “Spanish Flu” affected approximately one-fifth of the world’s population. Within months, it had killed more people than any other illness in recorded history. The plague emerged in two phases. In late spring of 1918, the first phase, known as the "three-day fever," appeared without warning. Few deaths were

reported. Victims recovered after a few days. When the disease surfaced again that fall, it was far more severe. In the U.S., about 28% of the population suffered, and 500,000 to 675,000 died. More people died of influenza in a single year than in four-years of the Black Death Bubonic Plague from 1347 to 1351.

Recently, concerns have been raised as to the potential for a global avian influenza (A-H5N1) pandemic. The first time influenza A-H5N1 infected humans occurred in Hong Kong in 1997 followed by a resurfacing of the virus in Vietnam and Thailand in late 2003. The westward spread of the virus began in 2004. While person to person transmission of the disease has been limited, health experts are concerned that as H5N1 continues to evolve it will become better adapted to humans and result in sustained and efficient person-to-person transmission with a global impact similar to 1918 pandemic levels. In November 2004, the director for the western region of the World Health Organization said that an influenza pandemic was inevitable and called for urgent plans to combat the virus. Table 2.173 below describes the annual occurrences of avian influenza since 2003 in affected countries.

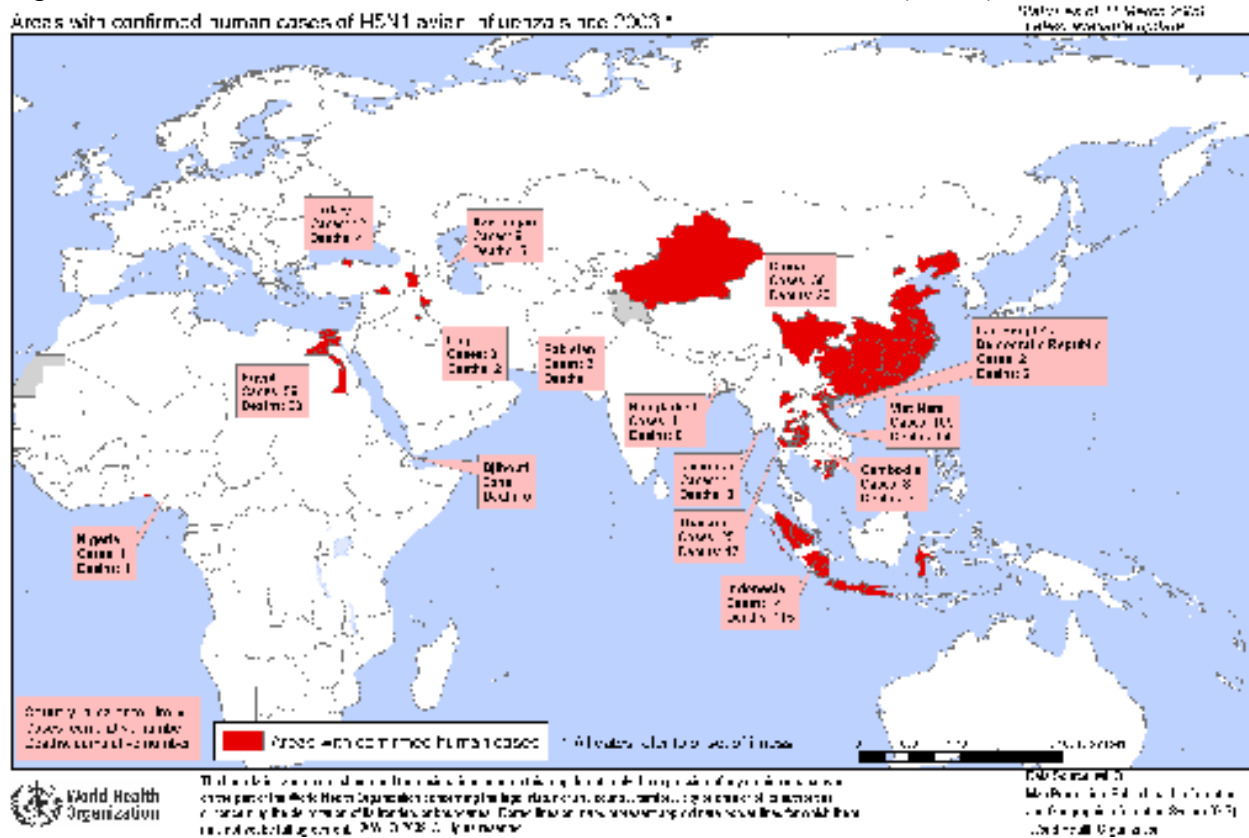
Table 2.173. Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to World Health Organization, 2003 – 2009.

Country	2003		2004		2005		2006		2007		2008		2009		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Cambodia	0	0	0	0	4	4	2	2	1	1	1	0	0	0	8	7
China	1	1	0	0	8	5	13	8	5	3	4	4	7	4	38	25
Djibouti	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Egypt	0	0	0	0	0	0	18	10	25	9	8	4	4	0	55	23
Indonesia	0	0	0	0	20	13	55	45	42	37	24	20	0	0	141	115
Iraq	0	0	0	0	0	0	3	2	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2	2
Myanmar	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Nigeria	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
Pakistan	0	0	0	0	0	0	0	0	3	1	0	0	0	0	3	1
Thailand	0	0	17	12	5	2	3	3	0	0	0	0	0	0	25	17
Turkey	0	0	0	0	0	0	12	4	0	0	0	0	0	0	12	4
Viet Nam	3	3	29	20	61	19	0	0	8	5	6	5	2	0	109	54
Total	4	4	46	32	98	43	115	79	88	59	44	33	13	4	408	256

Source: World Health Organization, Epidemic and Pandemic Alert and Response.
http://www.who.int/csr/disease/avian_influenza/country/cases_table_2009_03_11/en/index.html

To date, there have been 408 confirmed cases of H5N1 avian influenza throughout the world, resulting in 256 deaths. Figure 2.33 below depicts the spread of H5N1 avian influenza across the African and Asian continents and the number of confirmed cases as of March 11, 2009.

Figure 2.33. Areas with Confirmed Human Cases of Avian Influenza (H5N1), 2003 – 2009.



Source: World Health Organization, Epidemic and Pandemic Alert and Response.

<http://www.who.int/csr/disease/avian_influenza/en/>

Other Occurrences of Influenza

Recently, swine influenza A-H1N1 has caused widespread illness throughout the world. Swine influenza A-H1N1 is a subtype of influenza virus A and the most common cause of influenza (flu) in humans. The disease originated in Mexico in the Spring of 2009. As of May 15, 2009, the World Health Organization reports it has received nearly 6,500 officially confirmed cases of swine influenza A-H1N1 - including 65 deaths - from 33 countries. Locally, Florida had 69 confirmed cases in the following counties as of May 15, 2009: one in Osceola, Alachua, Indian River, Marion, Clay, Collier, Lake, Manatee, Flagler, Seminole, Okeechobee, and Duval, two in Brevard, St. Johns, and Palm Beach, 3 in Pinellas, Sarasota, and Orange, 7 in Lee, 8 in Hillsborough, 12 in Dade, and 15 in Broward. There have been no confirmed cases of swine influenza in Leon County to date. The World Health Organization has not yet classified the swine influenza outbreak as a pandemic. However, the situation is changing everyday. Given that the swine influenza outbreak is an ongoing phenomenon, a summary of the disease and its impact on Florida and Leon County will be discussed in a future update to the LMS.

Pandemic Influenza Vulnerability Analysis

Leon County residents are considered vulnerable to a pandemic influenza outbreak. Based on analysis of international pandemic influenza data, the Leon County population and local healthcare facilities, pandemic influenza is considered to be a medium-risk for Leon County residents. Though there have been no recent occurrences of a pandemic influenza in Leon County, it is important understand the potential impact of a pandemic on the local population. FluSurge 2.0, a program created by the Center for Disease Control, was used to assess potential impacts of a pandemic influenza outbreak on the local population in each jurisdiction and for all of Leon County. FluSurge 2.0 calculates the likely number of hospital admissions and death based on local healthcare facilities and equipment, and also the age of the local population. Young children and older adults (65 years and older) are considered particularly vulnerable groups of the population. FluSurge 2.0 was used to model scenarios with varying attack rates, or exposure levels. A 15 percent attack rate was used to create a low-impact scenario and a 25 percent attack rate was used to create a medium-impact or moderate scenario. Lastly, a high-impact or severe scenario was created using a 35 percent attack rate, which is similar to conditions experienced during the deadly 1918 influenza pandemic. Table 2.174 below describes the terms used in reporting the results of the FluSurge 2.0 analysis.

Table 2.174. FluSurge 2.0 Reporting Guide, 2009.

Weekly admission	The total number of influenza patients admitted to the hospital during each pandemic week.
Peak admission/day	The peak number of daily hospital admissions of influenza patients and the week in which the peak occurs.
# of influenza patients in hospital	The maximum daily number of influenza patients hospitalized in a given week. The maximum number of influenza patients in the hospital in a week is lower than the number of weekly admissions because we assume a 5-day stay in general wards (10-day stay in the ICU and 10-day use of a ventilator). For example, patients admitted at the beginning of the first week will not be in the hospital during the second week.
% of hospital capacity needed	The proportion of all staffed non-ICU hospital beds that would be occupied by influenza patients. For example, 2,013 influenza patients in the hospital is equivalent to 28% of the hospitals' total capacity, that is, 28% of total staffed beds will be required. Many hospitals do not have such surplus capacity available.
# of influenza patients in ICU	The maximum daily number of influenza patients requiring ICU care in a given week.
% of ICU capacity needed	The proportion of all staffed ICU beds that would be occupied by influenza patients. For example, 583 influenza patients in the ICU is equivalent to 77% of the ICU's total capacity.
# of influenza patients on ventilators	The maximum daily number of influenza patients requiring ventilator support in a given week
% usage of ventilator	The proportion of all mechanical ventilators that would be used by influenza patients. For example, 292 influenza patients using ventilators is equivalent to 42% usage of the total ventilators available.
# of deaths from influenza	The total number of influenza patients that died during each pandemic week. Here, we assume that deaths start at the beginning of the 3rd week.
# of influenza deaths in hospital	The total number of influenza patients that died in hospitals during each pandemic week.

Leon County Pandemic Influenza Vulnerability Analysis

Based on analysis of current population and local healthcare facilities, FluSurge 2.0 was used to generate a pandemic influenza scenario in Leon County. Based on the results of this analysis, a pandemic lasting six to eight weeks with a 15 percent impact rate on the population would result in 489 hospitalizations and 90 deaths. Modeled on conditions during the 1918 influenza pandemic, a pandemic lasting six to eight weeks with a 35 percent impact rate would result in 1,140 hospitalizations and 210 deaths in Leon County. The results of this analysis for Leon County are displayed in the tables and figures below.

Table 2.175. Leon County Population by Age Group, 2008.

Age Group	Population
0-19 yrs	67,653
20-64 yrs	167,872
+ 65 yrs	22,105

Table 2.176. Leon County Basic Hospital Resources, 2009.

Total licensed non-ICU beds:	893
% licensed non-ICU beds staffed:	100%
Total staffed non-ICU beds:	893
Total licensed ICU beds:	102
% licensed ICU beds staffed:	100%
Total Staffed ICU beds:	102
Total number of ventilators:	83
% ventilators available:	100%
Total number of ventilators available:	83

Table 2.177. Leon County Pandemic Influenza Impact Scenarios, 2009 (Assumes 35% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Attack Rate	35%
<i>Total Hospital Admissions</i>	
Most Likely Scenario	1,140
Minimum Scenario	388
Maximum Scenario	1,519
<i>Total Deaths</i>	
Most Likely Scenario	210
Minimum Scenario	101
Maximum Scenario	369

Figure 2.34. Leon County Distribution of Hospital Admissions, 2009 (Assumes 35% of Population Affected for a Duration of 6 -8 Weeks).

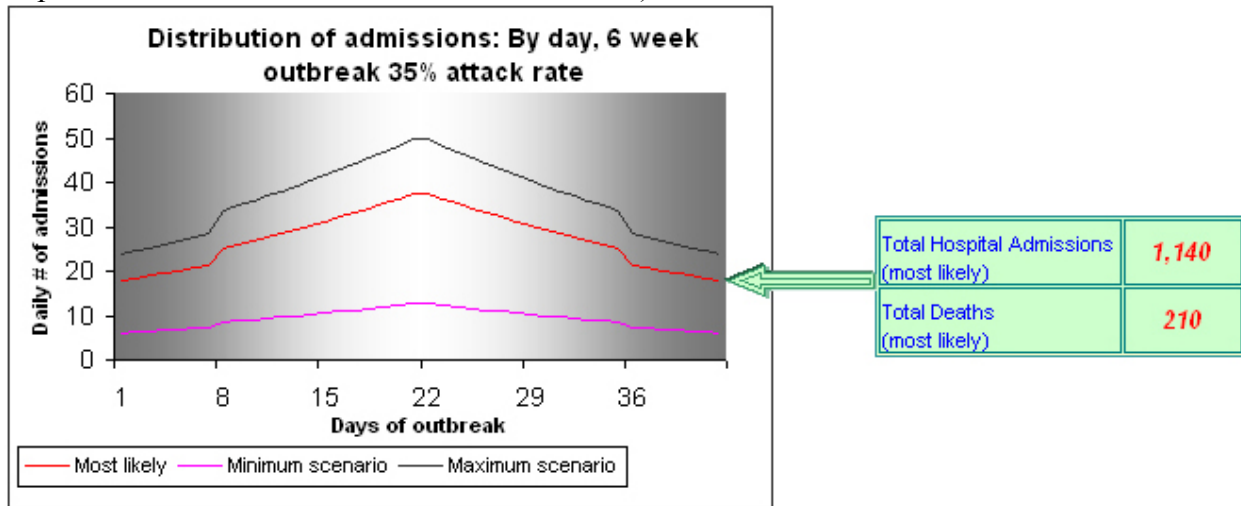


Table 2.178. Leon County Pandemic Influenza Impact, 2009 (Assumes 35% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Weeks		1	2	3	4	5	6	7	8
Hospital Admission	Weekly admissions	137	194	239	239	194	137		
	Peak admissions/day			37	37				
Hospital Capacity	# of influenza patients in hospital	101	143	176	182	161	127		
	% of hospital capacity needed	11%	16%	20%	20%	18%	14%		
ICU Capacity	# of influenza patients in ICU	21	38	49	53	51	42		
	% of ICU capacity needed	20%	38%	48%	52%	50%	41%		
Ventilator Capacity	# of influenza patients on ventilators	10	19	25	26	26	21		
	% usage of ventilator	12%	23%	30%	32%	31%	25%		
Deaths	# of deaths from influenza			25	36	44	44	36	25
	# of influenza deaths in hospital			18	25	31	31	25	18

Table 2.179. Leon County Pandemic Influenza Impact Scenarios, 2009 (Assumes 25% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Attack Rate	25%
Total Hospital Admissions	
Most Likely Scenario	815
Minimum Scenario	277
Maximum Scenario	1,085
Total Deaths	
Most Likely Scenario	150
Minimum Scenario	72
Maximum Scenario	264

Figure 2.35. Leon County Distribution of Hospital Admissions, 2009 (Assumes 25% of Population Affected for a Duration of 6 -8 Weeks).

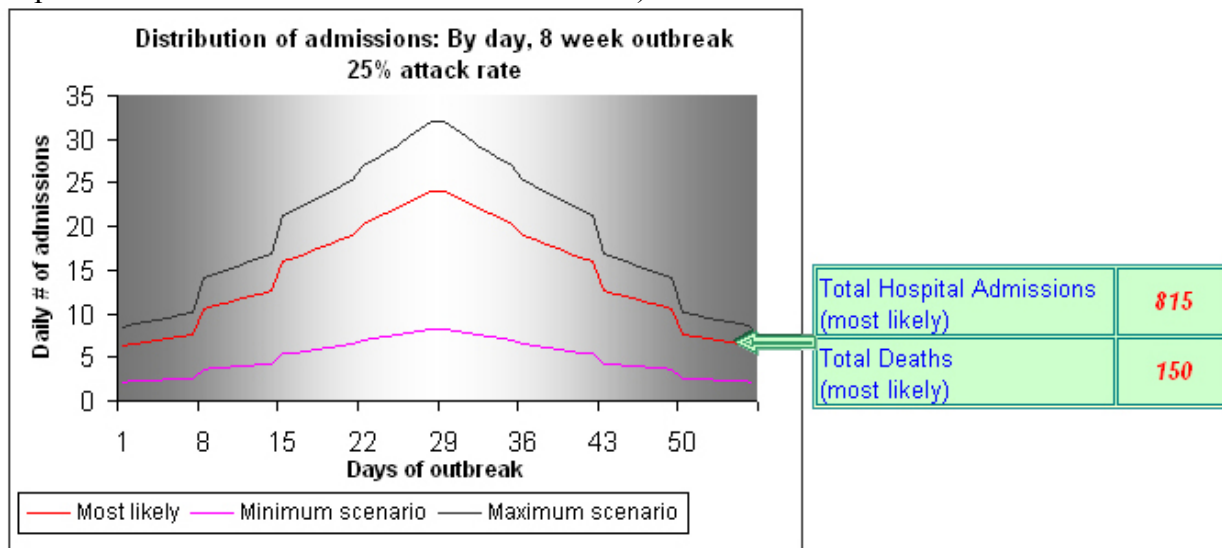


Table 2.180. Leon County Pandemic Influenza Impact, 2009 (Assumes 25% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Weeks		1	2	3	4	5	6	7	8
Hospital Admission	Weekly admissions	98	138	171	171	138	98		
	Peak admissions/day			27	27				
Hospital Capacity	# of influenza patients in hospital	72	102	126	130	115	91		
	% of hospital capacity needed	8%	11%	14%	15%	13%	10%		
ICU Capacity	# of influenza patients in ICU	15	27	35	38	37	30		
	% of ICU capacity needed	14%	27%	34%	37%	36%	29%		
Ventilator Capacity	# of influenza patients on ventilators	7	14	18	19	18	15		
	% usage of ventilator	9%	17%	21%	23%	22%	18%		
Deaths	# of deaths from influenza			18	25	31	31	25	18
	# of influenza deaths in hospital			13	18	22	22	18	13

Table 2.181. Leon County Pandemic Influenza Impact Scenarios, 2009 (Assumes 15% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Attack Rate	15%
Total Hospital Admissions	
Most Likely Scenario	489
Minimum Scenario	166
Maximum Scenario	651
Total Deaths	
Most Likely Scenario	90
Minimum Scenario	43
Maximum Scenario	158

Figure 2.36. Leon County Distribution of Hospital Admissions, 2009 (Assumes 15% of Population Affected for a Duration of 6 -8 Weeks).

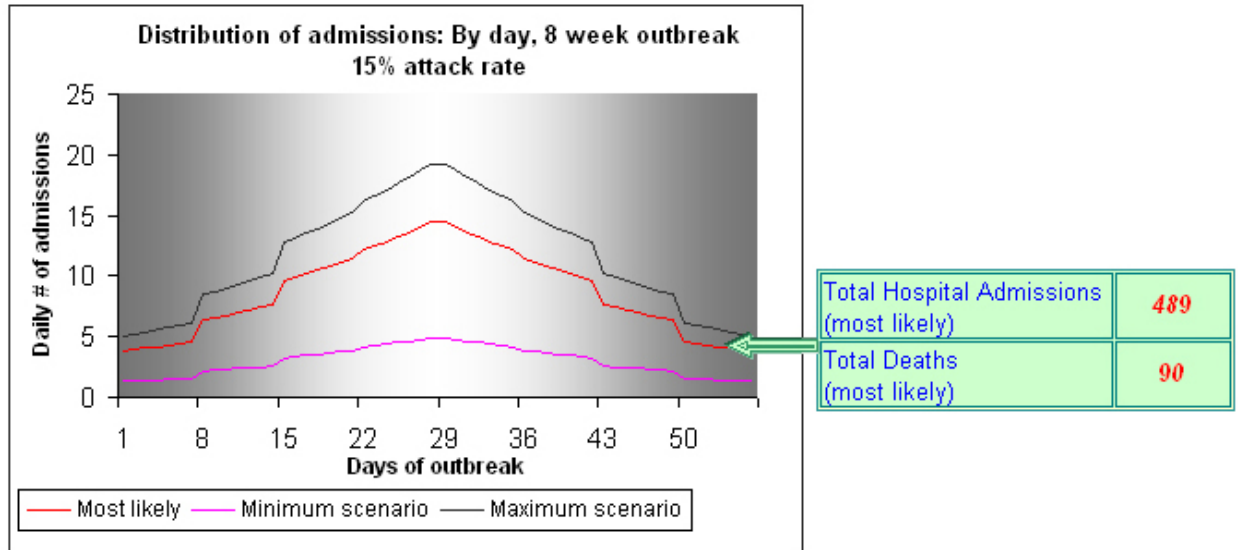


Table 2.182. Leon County Pandemic Influenza Impact, 2009 (Assumes 15% of Population Affected for a Duration of 6 -8 Weeks).

Influenza Pandemic Impact / Weeks		1	2	3	4	5	6	7	8
Hospital Admission	Weekly admissions	59	83	103	103	83	59		
	Peak admissions/day			16	16				
Hospital Capacity	# of influenza patients in hospital	43	61	75	78	69	55		
	% of hospital capacity needed	5%	7%	8%	9%	8%	6%		
ICU Capacity	# of influenza patients in ICU	9	16	21	23	22	18		
	% of ICU capacity needed	9%	16%	21%	22%	22%	18%		
Ventilator Capacity	# of influenza patients on ventilators	4	8	11	11	11	9		
	% usage of ventilator	5%	10%	13%	14%	13%	11%		
Deaths	# of deaths from influenza			11	15	19	19	15	11
	# of influenza deaths in hospital			8	11	13	13	11	8

City of Tallahassee Pandemic Influenza Vulnerability Scenario

Based on analysis of current population and local healthcare facilities, FluSurge 2.0 was used to generate a pandemic influenza scenario in the City of Tallahassee. Based on the results of this analysis, a pandemic lasting six to eight weeks with a 15 percent impact rate on the population would result in 310 hospitalizations and 56 deaths. Modeled on conditions during the 1918 influenza pandemic, a pandemic lasting six to eight weeks with a 35 percent impact rate would result in 723 hospitalizations and 131 deaths in the City of Tallahassee. The results of this analysis for the City of Tallahassee are displayed in the tables and figures below.

Table 2.183. City of Tallahassee Population by Age Group, 2008.

Age Group	Population
0-19 yrs	40,633
20-64 yrs	109,120
+ 65 yrs	13,154

Table 2.184. City of Tallahassee_Basic Hospital Resources, 2009.

Total licensed non-ICU beds:	688
% licensed non-ICU beds staffed:	100%
Total staffed non-ICU beds:	688
Total licensed ICU beds:	82
% licensed ICU beds staffed:	100%
Total Staffed ICU beds:	82
Total number of ventilators:	50
% ventilators available:	100%
Total number of ventilators available:	50

Table 2.185. City of Tallahassee_Pandemic Influenza Impact Scenarios, 2009 (Assumes 35% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Attack Rate	35%
Total Hospital Admissions	
Most Likely Scenario	723
Minimum Scenario	239
Maximum Scenario	958
Total Deaths	
Most Likely Scenario	131
Minimum Scenario	61
Maximum Scenario	233

Figure 2.37. City of Tallahassee_Distribution of Hospital Admissions, 2009 (Assumes 35% of Population Affected for a Duration of 6 -8 Weeks).

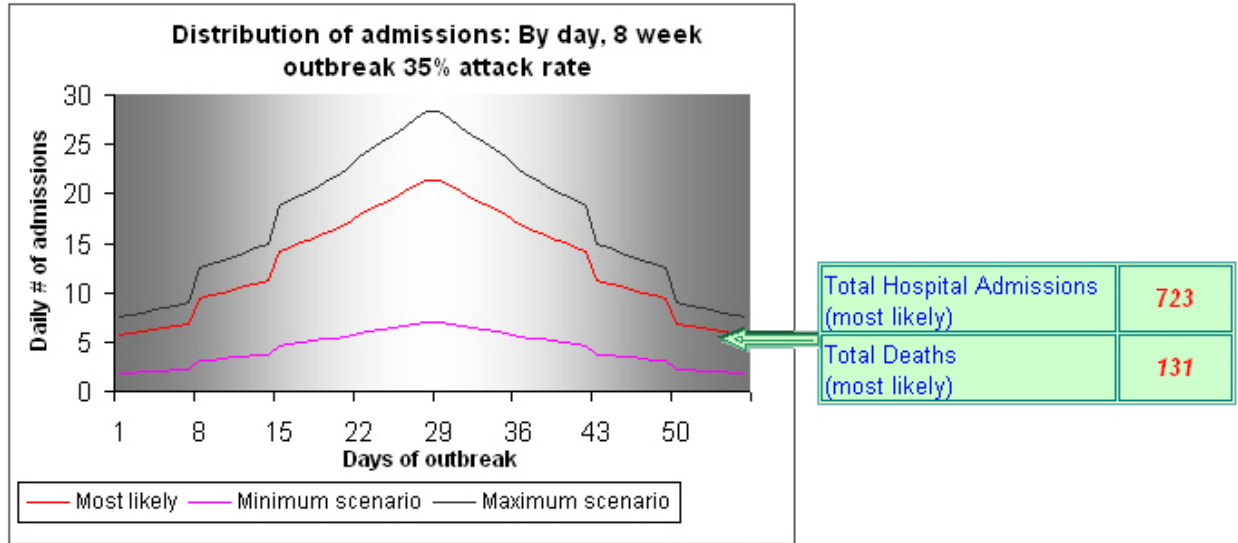


Table 2.186. City of Tallahassee_Pandemic Influenza Impact, 2009 (Assumes 35% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Weeks		1	2	3	4	5	6	7	8
Hospital Admission	Weekly admissions	87	123	152	152	123	87		
	Peak admissions/day			24	24				
Hospital Capacity	# of influenza patients in hospital	64	90	112	116	102	81		
	% of hospital capacity needed	9%	13%	16%	17%	15%	12%		
ICU Capacity	# of influenza patients in ICU	13	24	31	33	33	27		
	% of ICU capacity needed	16%	30%	38%	41%	40%	32%		
Ventilator Capacity	# of influenza patients on ventilators	7	12	16	17	16	13		
	% usage of ventilator	13%	24%	31%	33%	33%	27%		
Deaths	# of deaths from influenza			16	22	28	28	22	16
	# of influenza deaths in hospital			11	16	19	19	16	11

Table 2.187. City of Tallahassee_Pandemic Influenza Impact Scenarios, 2009 (Assumes 25% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Attack Rate	25%
Total Hospital Admissions	
Most Likely Scenario	517
Minimum Scenario	171
Maximum Scenario	684
Total Deaths	
Most Likely Scenario	94
Minimum Scenario	44
Maximum Scenario	166

Figure 2.38. City of Tallahassee_Distribution of Hospital Admissions, 2009 (Assumes 25% of Population Affected for a Duration of 6 -8 Weeks).

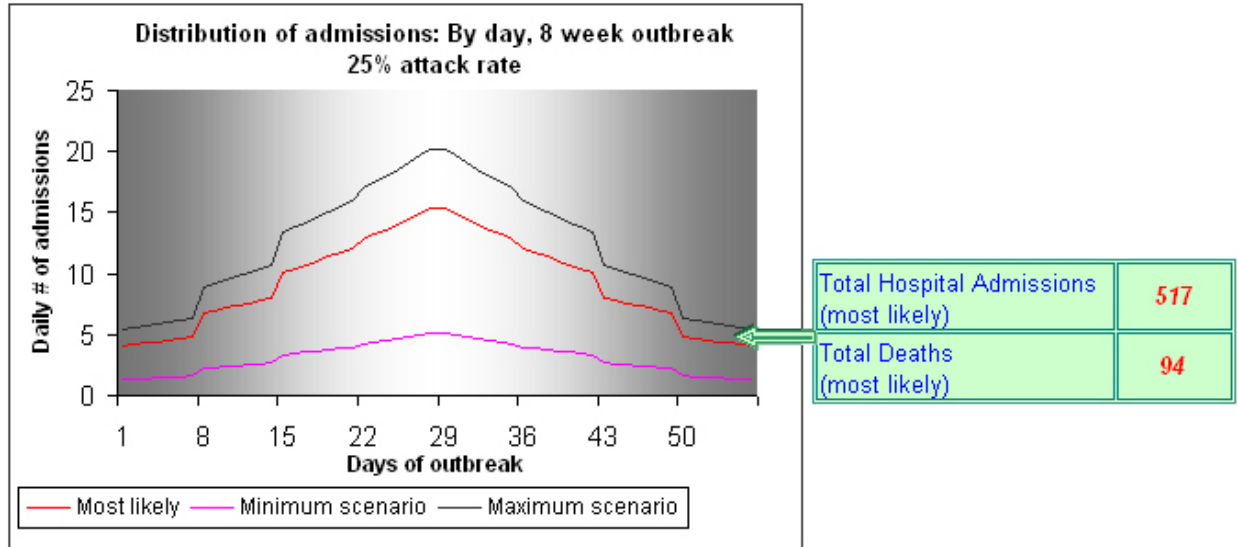


Table 2.188. City of Tallahassee_Pandemic Influenza Impact, 2009 (Assumes 25% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Weeks		1	2	3	4	5	6	7	8
Hospital Admission	Weekly admissions	62	88	109	109	88	62		
	Peak admissions/day			17	17				
Hospital Capacity	# of influenza patients in hospital	46	65	80	83	73	58		
	% of hospital capacity needed	7%	9%	12%	12%	11%	8%		
ICU Capacity	# of influenza patients in ICU	9	17	22	24	23	19		
	% of ICU capacity needed	11%	21%	27%	29%	28%	23%		
Ventilator Capacity	# of influenza patients on ventilators	5	9	11	12	12	9		
	% usage of ventilator	9%	17%	22%	24%	23%	19%		
Deaths	# of deaths from influenza			11	16	20	20	16	11
	# of influenza deaths in hospital			8	11	14	14	11	8

Table 2.189. City of Tallahassee_Pandemic Influenza Impact Scenarios, 2009 (Assumes 15% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Attack Rate	15%
Total Hospital Admissions	
Most Likely Scenario	310
Minimum Scenario	102
Maximum Scenario	410
Total Deaths	
Most Likely Scenario	56
Minimum Scenario	26
Maximum Scenario	100

Figure 2.39. City of Tallahassee_Distribution of Hospital Admissions, 2009 (Assumes 15% of Population Affected for a Duration of 6 -8 Weeks).

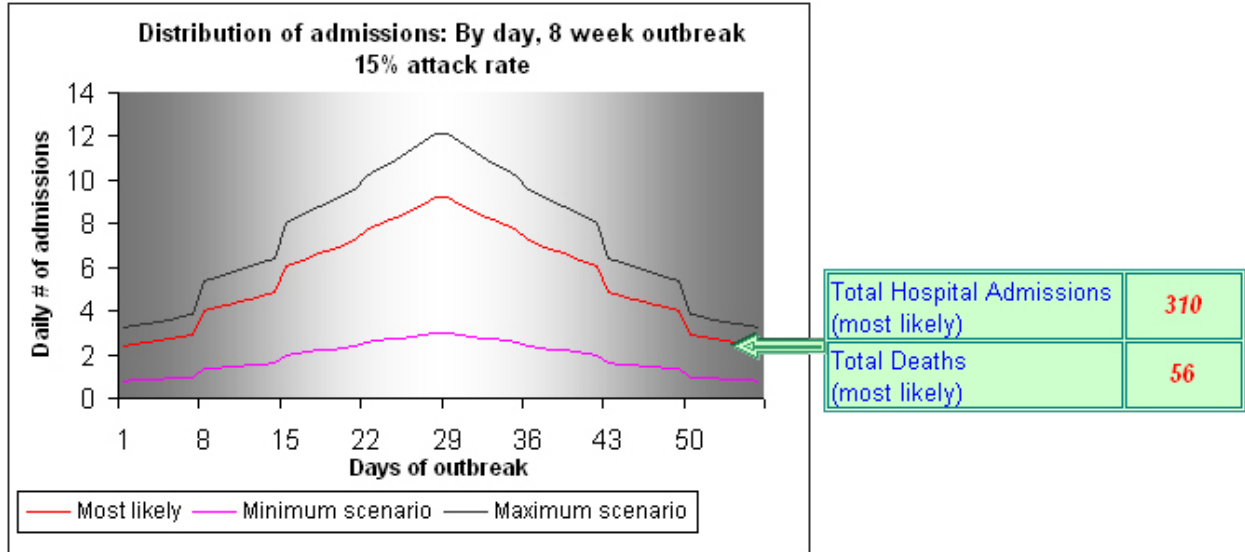


Table 2.190. City of Tallahassee_Pandemic Influenza Impact, 2009 (Assumes 15% of Population Affected for a Duration of 6 -8 Weeks).

Influenza Pandemic Impact / Weeks		1	2	3	4	5	6	7	8
Hospital Admission	Weekly admissions	37	53	65	65	53	37		
	Peak admissions/day			10	10				
Hospital Capacity	# of influenza patients in hospital	27	39	48	50	44	35		
	% of hospital capacity needed	4%	6%	7%	7%	6%	5%		
ICU Capacity	# of influenza patients in ICU	6	10	13	14	14	11		
	% of ICU capacity needed	7%	13%	16%	18%	17%	14%		
Ventilator Capacity	# of influenza patients on ventilators	3	5	7	7	7	6		
	% usage of ventilator	6%	10%	13%	14%	14%	11%		
Deaths	# of deaths from influenza			7	10	12	12	10	7
	# of influenza deaths in hospital			5	7	8	8	7	5

Unincorporated Areas of Leon County Pandemic Influenza Vulnerability Scenario

Based on analysis of current population and local healthcare facilities, FluSurge 2.0 was used to generate a pandemic influenza scenario in the unincorporated areas of Leon County. Based on the results of this analysis, a pandemic lasting six to eight weeks with a 15 percent impact rate on the population would result in 179 hospitalizations and 33 deaths. Modeled on conditions during the 1918 influenza pandemic, a pandemic lasting six to eight weeks with a 35 percent impact rate would result in 417 hospitalizations and 78 deaths in the unincorporated areas of Leon County. The results of this analysis are displayed in the tables and figures below.

Table 2.191. Unincorporated Areas of Leon County Population by Age Group, 2008.

Age Group	Population
0-19 yrs	27,020
20-64 yrs	58,752
+ 65 yrs	8,951

Table 2.192. Unincorporated Areas of Leon County Basic Hospital Resources, 2009.

Total licensed non-ICU beds:	205
% licensed non-ICU beds staffed:	100%
Total staffed non-ICU beds:	205
Total licensed ICU beds:	20
% licensed ICU beds staffed:	100%
Total Staffed ICU beds:	20
Total number of ventilators:	33
% ventilators available:	100%
Total number of ventilators available:	33

Table 2.193. Unincorporated Areas of Leon County Pandemic Influenza Impact Scenarios, 2009 (Assumes 35% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Attack Rate	35%
Total Hospital Admissions	
Most Likely Scenario	417
Minimum Scenario	149
Maximum Scenario	562
Total Deaths	
Most Likely Scenario	78
Minimum Scenario	40
Maximum Scenario	137

Figure 2.40. Unincorporated Areas of Leon County Distribution of Hospital Admissions, 2009 (Assumes 35% of Population Affected for a Duration of 6 -8 Weeks).

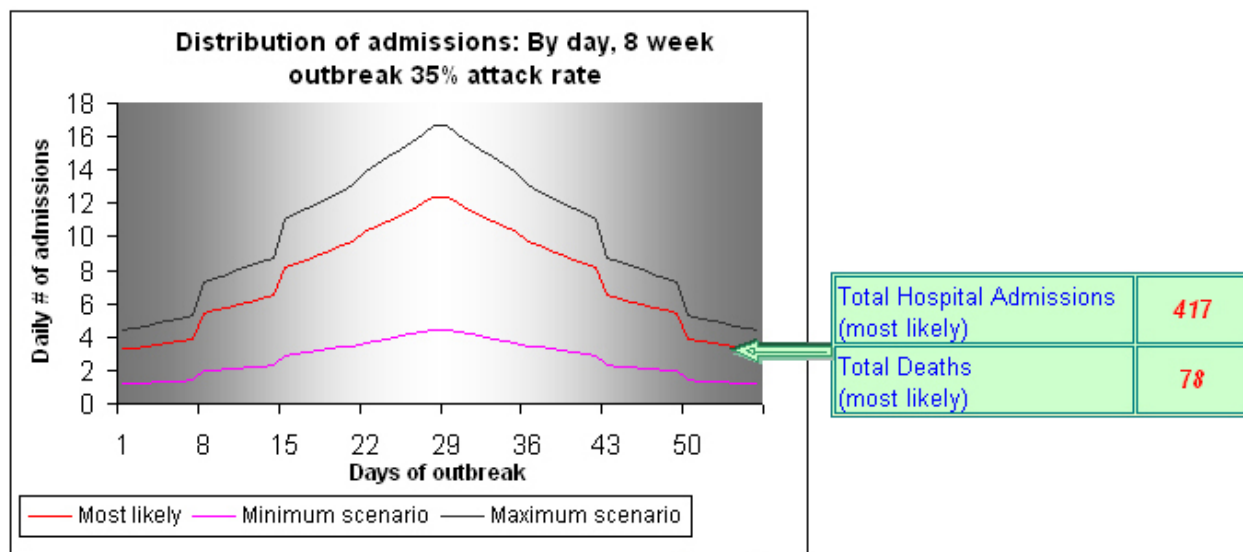


Table 2.194. Unincorporated Areas of Leon County Pandemic Influenza Impact, 2009 (Assumes 35% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Weeks		1	2	3	4	5	6	7	8
Hospital Admission	Weekly admissions	50	71	88	88	71	50		
	Peak admissions/day			14	14				
Hospital Capacity	# of influenza patients in hospital	37	52	64	67	59	47		
	% of hospital capacity needed	18%	25%	31%	33%	29%	23%		
ICU Capacity	# of influenza patients in ICU	8	14	18	19	19	15		
	% of ICU capacity needed	38%	70%	90%	97%	94%	76%		
Ventilator Capacity	# of influenza patients on ventilators	4	7	9	10	9	8		
	% usage of ventilator	11%	21%	27%	29%	29%	23%		
Deaths	# of deaths from influenza			9	13	16	16	13	9
	# of influenza deaths in hospital			7	9	11	11	9	7

Table 2.195. Unincorporated Areas of Leon County Pandemic Influenza Impact Scenarios, 2009 (Assumes 25% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Attack Rate	25%
Total Hospital Admissions	
Most Likely Scenario	298
Minimum Scenario	106
Maximum Scenario	401
Total Deaths	
Most Likely Scenario	56
Minimum Scenario	29
Maximum Scenario	98

Figure 2.41. Unincorporated Areas of Leon County Distribution of Hospital Admissions, 2009 (Assumes 25% of Population Affected for a Duration of 6 -8 Weeks).

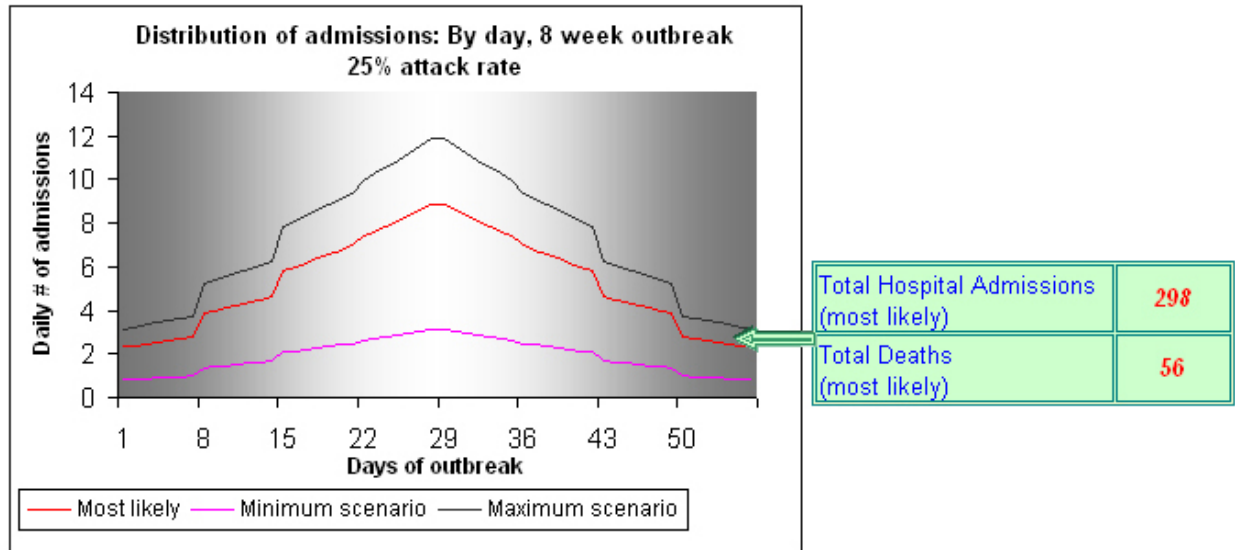


Table 2.196. Unincorporated Areas of Leon County Pandemic Influenza Impact, 2009 (Assumes 25% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Weeks		1	2	3	4	5	6	7	8
Hospital Admission	Weekly admissions	36	51	63	63	51	36		
	Peak admissions/day			10	10				
Hospital Capacity	# of influenza patients in hospital	26	37	46	48	42	33		
	% of hospital capacity needed	13%	18%	22%	23%	21%	16%		
ICU Capacity	# of influenza patients in ICU	5	10	13	14	13	11		
	% of ICU capacity needed	27%	50%	64%	69%	67%	55%		
Ventilator Capacity	# of influenza patients on ventilators	3	5	6	7	7	5		
	% usage of ventilator	8%	15%	19%	21%	20%	17%		
Deaths	# of deaths from influenza			7	9	12	12	9	7
	# of influenza deaths in hospital			5	7	8	8	7	5

Table 2.197. Unincorporated Areas of Leon County Pandemic Influenza Impact Scenarios, 2009 (Assumes 15% of Population Affected for a Duration of 6 -8 Weeks).

Pandemic Influenza Impact / Attack Rate	15%
Total Hospital Admissions	
Most Likely Scenario	179
Minimum Scenario	64
Maximum Scenario	241
Total Deaths	
Most Likely Scenario	33
Minimum Scenario	17
Maximum Scenario	59

Figure 2.42. Unincorporated Areas of Leon County Distribution of Hospital Admissions, 2009 (Assumes 15% of Population Affected for a Duration of 6 -8 Weeks).

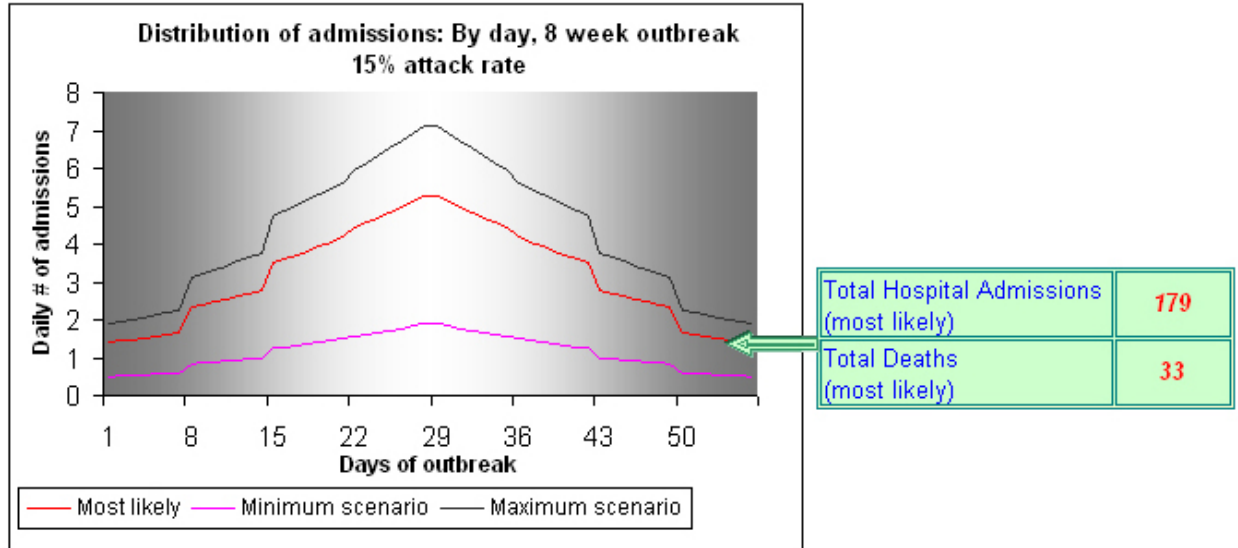


Table 2.198. Unincorporated Areas of Leon County Pandemic Influenza Impact, 2009 (Assumes 15% of Population Affected for a Duration of 6 -8 Weeks).

Influenza Pandemic Impact / Weeks		1	2	3	4	5	6	7	8
Hospital Admission	Weekly admissions	21	30	38	38	30	21		
	Peak admissions/day			6	6				
Hospital Capacity	# of influenza patients in hospital	16	22	28	29	25	20		
	% of hospital capacity needed	8%	11%	13%	14%	12%	10%		
ICU Capacity	# of influenza patients in ICU	3	6	8	8	8	7		
	% of ICU capacity needed	16%	30%	38%	41%	40%	33%		
Ventilator Capacity	# of influenza patients on ventilators	2	3	4	4	4	3		
	% usage of ventilator	5%	9%	12%	13%	12%	10%		
Deaths	# of deaths from influenza			4	6	7	7	6	4
	# of influenza deaths in hospital			3	4	5	5	4	3

2. 17 Storm Surge and Tsunami Hazard Profile

Earthquakes, volcanic eruptions and other underwater explosions (detonations of nuclear devices at sea), landslides, bolide impacts, and other mass movements above or below water all have the potential to generate a tsunami. Due to the immense volumes of water and energy involved, the effects of tsunamis can be devastating. Some meteorological storm conditions such as deep depressions causing cyclones, hurricanes, can generate a storm surge which can be several metres above normal tide levels. This is due to the low atmospheric pressure within the centre of the depression. As these storm surges come ashore, they may resemble (though are not) tsunamis, inundating vast areas of land. There is often no advance warning of an approaching tsunami. However, since earthquakes are often a cause of tsunami, any earthquake occurring near a body of water may generate a tsunami if it occurs at shallow depth, is of moderate or high magnitude, and the water volume and depth is sufficient.

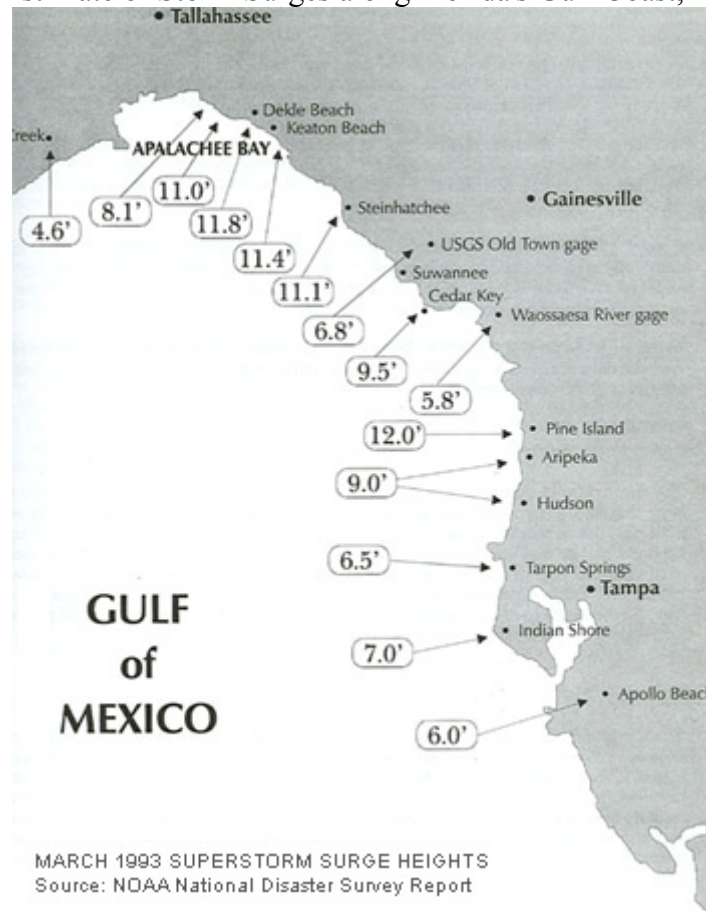
Storm surge is defined as an abnormal rise in sea level accompanying a hurricane or other intense storm, and whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the cyclone. Storm surge is usually estimated by subtracting the normal or astronomic high tide from the observed storm tide. Storm surge is evaluated separately from rain-driven flooding. Note: waves on top of the storm surge will create an even greater high-water mark.

Historical Occurrences of Storm Surge and Tsunamis

Beginning March 12 and subsiding on March 15, 1993 a large cyclonic storm swept through the eastern coast of the North America. Named the 1993 Superstorm and the Great Blizzard of 1993, the storm stretched from Central America to Canada. It is unique for its intensity, massive size and wide-reaching effect. Areas as far south as central Alabama and Georgia received 6 to 8 inches of snow and areas such as Birmingham, Alabama, received up to 12 inches with isolated reports of 16 inches. The Florida Panhandle reported up to 4 inches of snow, with hurricane-force wind gusts and record low barometric pressures. Between Louisiana and Cuba, hurricane-force winds produced extreme storm surges in the Gulf of Mexico, which along with scattered tornadoes killed dozens of people.²³ The uperstorm also produced substantial storm surge along the Gulf Coast from Apalachee Bay in the Florida panhandle to south of Tampa Bay. Storm surges in those areas reached up to 12 feet, higher than many hurricanes. Figure 2.43 displays estimated hieghts for storm surge produced produced by the 1993 superstorm.

²³ Storm of the Century, Wikipedia, The Free Online Encyclopedia, 2009.
<[http://en.wikipedia.org/wiki/Storm_of_the_Century_\(1993\)](http://en.wikipedia.org/wiki/Storm_of_the_Century_(1993))>

Figure 2.43. NOAA Estimate of Storm Surges along Florida's Gulf Coast, 13 March 1993.



Source: Wikipedia, "Storm of the Century, 1993."
<[http://en.wikipedia.org/wiki/Storm_of_the_Century_\(1993\)](http://en.wikipedia.org/wiki/Storm_of_the_Century_(1993))>

Despite the significant heights of storm surges associated with the 1993 Superstorm, the storm surge did not reach Leon County.

Tsunami Vulnerability Analysis

Leon County and the City of Tallahassee are not considered to be vulnerable to true tsunami events, although such occurrences are possible as a result of volcanic activity in the Caribbean or from submarine landslides in the Gulf of Mexico. As earthquake risks are nominal in the Apalachee Bay and central Gulf of Mexico areas, the likelihood of tsunamis at the coastline is minimal for the planning horizon and the probability of striking Leon County is assumed to be zero. However, storm surge (as distinct from flooding) can affect Leon County. Probable depths for storm surges associated with Category 3-5 hurricanes are displayed in Maps 3 –5. Depths greater than 14 feet are predicted along the St. Marks River and along Munson Slough. Based on assessment of historical data and MEMPHIS analysis, storm surge and tsunamis are classified as a low-risk to Leon County residents. MEMPHIS data analysis reveals that population in Leon County, the City of Tallahassee, and the unincorporated areas are not vulnerable to tsunami or

storm surge events. Therefore, at-risk population data tables reflecting the zero-population vulnerability to tsunamis and storm surge generated using MEMPHIS software were omitted from the vulnerability analysis. The probability of tsunami or storm surge frequency is not zero, but the return interval for tsunami in this region is assumed to be greater than 500 years.

Figure 2.44. Leon County Tsunami Vulnerability MEMPHIS Map, 2005.

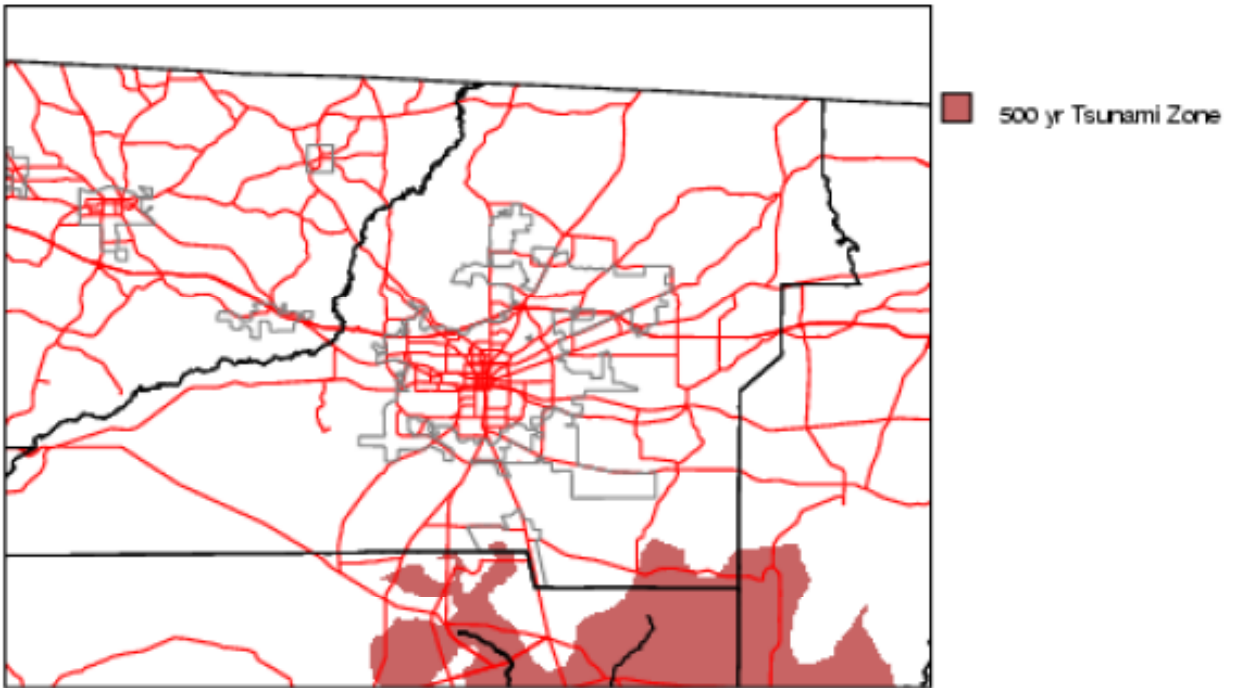


Table 2.199. Leon County Structures At-Risk from a Tsunami, 2005.

Zone	Total	SF Res	Mob Home	MF Res	Commercial	Agriculture	Gov/Instit
Out of Zone	32	6	18	0	1	0	7
500 yr Tsunami	0	0	0	0	0	0	0
	0	0	0	0	0	0	0

Table 2.200. Value of Leon County Structures At-Risk from a Tsunami, 2005.

Zone	Total	SF Res	Mob Home	MF Res	Commercial	Agriculture	Gov/Instit
Out of Zone	\$ 30.89 MI	\$ 1.75 MI	\$ 1.65 MI	\$ 0.00	\$ 254.53 TH	\$ 20.88 MI	\$ 6.35 MI
500 yr Tsunami	\$ 8.85 MI	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 8.85 MI	\$ 0.00
	\$ 767.46 MI	\$ 0.00	\$ 0.00	\$ 0.00	\$ 767.46 MI	\$ 0.00	\$ 0.00

Table 2.201. Unincorporated Areas Structures At-Risk from a Tsunami, 2005.

Zone	Total	SF Res	Mob Home	MF Res	Commercial	Agriculture	Gov/Instit
Out of Zone	32	6	18	0	1	0	7
500 yr Tsunami	0	0	0	0	0	0	0
	0	0	0	0	0	0	0

Table 2.202. Value of Unincorporated Areas Structures At-Risk from a Tsunami, 2005.

Zone	Total	SF Res	Mob Home	MF Res	Commercial	Agriculture	Gov/Instit
Out of Zone	\$ 10.00 MI	\$ 1.75 MI	\$ 1.65 MI	\$ 0.00	\$ 254.53 TH	\$ 0.00	\$ 6.35 MI
500 yr Tsunami	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00

Table 2.203. City of Tallahassee Structures At-Risk from a Tsunami, 2005.

Zone	Total	SF Res	Mob Home	MF Res	Commercial	Agriculture	Gov/Instit
Out of Zone	0	0	0	0	0	0	0
500 yr Tsunami	0	0	0	0	0	0	0
	0	0	0	0	0	0	0

Table 2.204. Value of City of Tallahassee Structures At-Risk from a Tsunami, 2005.

Zone	Total	SF Res	Mob Home	MF Res	Commercial	Agriculture	Gov/Instit
Out of Zone	\$20.89 MI	\$0.00	\$0.00	\$0.00	\$0.00	\$20.89 MI	\$0.00
500 yr Tsunami	\$8.85 MI	\$0.00	\$0.00	\$0.00	\$0.00	\$8.85 MI	\$0.00
	\$767.46 MI	\$0.00	\$0.00	\$0.00	\$767.46 MI	\$0.00	\$0.00

2.18 Selected Technological and Societal Hazards

As part of the evaluation process for the 2010 LMS update, technological and societal hazards identified in the previously adopted plan were also analyzed by staff. Based on discussions with DEM officials and LMS Committee staff, the majority of technological and societal hazards discussed in the previous plans were removed from the 2010 update. The purpose of the LMS is to address community vulnerability to natural hazards, as specified by FEMA regulations. Additionally, procedures and plans for addressing local vulnerability to these societal and technological hazards are developed, maintained and updated by other local agencies and departments. For example, the City of Tallahassee Utilities maintains plans and procedures for dealing with power and gas loss during hazard events, both natural and man-made. The Leon County CEMP also details mitigation actions and local plans for addressing local vulnerability to these hazards. Given the extent of procedures in other local planning documents for addressing societal and technological hazards, these hazard profiles have been eliminated from the 2010 LMS update. However, updated hazard profiles for hazardous materials and terrorism are included in the current plan.

2.19 Hazardous Materials Hazard Analysis

The Occupational Safety and Health Administration requires the completion of a Material Safety Data Sheet for more than 500,000 chemicals. A variety of these potentially hazardous materials are found throughout Leon County, although their presence may not be readily apparent. The threat to public health may occur during the use, storage, transport, or improper disposal of these hazardous chemicals and their wastes. The following analysis focuses on Environmental Protection Agency (EPA) designated Extremely Hazardous Substances stored at fixed facilities, and the generation, disposal and transportation of small and large quantity generators of hazardous waste in Leon County.

Extremely Hazardous Substances

Chemicals vary in terms of the degree to which they pose a threat to public health and safety. Airborne substances and materials with low combustible temperatures and high toxicity are of serious concern. Currently, the Environmental Protection Agency classifies 366 Extremely Hazardous Substances (EHS). EHS are those chemicals with acutely toxic properties that pose the most significant threat to public health. Facilities using EHS above threshold planning quantities are required to report to the Florida Department of Community Affairs under the Emergency Planning and Community Right to Know Act of 1986 (EPCRA). The Apalachee Regional Planning Council maintains a detailed description and map of Section 302 facilities information, including facility name, location, ownership, contact person, vulnerable zone (VZ), vulnerable population, evacuation routes, type and amount of EHS, and known critical facilities within the VZ. The VZ is the geographical area that is at risk of exposure to concentrations of an airborne EHS at levels dangerous to life or health in the event of a chemical release. Table 2.205 lists the number of sites, type of EHS used, vulnerable population range, and types of critical facilities within the vulnerable zones of each facility owner.

Table 2.205. Facilities Storing EHS's Above Threshold Planning Quantities, 2009.

Facility Owner	Number of Sites	EHS	Vulnerable Populations	Critical Facilities
A T & T Corporation	1	Sulfuric Acid	1	None
Airgas South	1	Chlorine	623	None
Alltel Florida	1	Sulfuric Acid	1	None
ALSCO	1	Sulfuric Acid	643	None
City of Tallahassee	26	Anhydrous Ammonia (1)	7677	Day Care Centers (1)
		Sulfuric Acid (1)	54	None
		Hydrogen Chloride (1)	49	None
		Chlorine (25)	254,671	All (1); Day Care Centers (14); Schools (13); Hospital (1)
Coca-Cola Enterprises	1	Sulfuric Acid	30	None
Comcast Cable Vision of West Florida	1	Sulfuric Acid	180	None
EMBARQ	7	Sulfuric Acid (7)	258	None (7)
Florida State University	1	Sulfuric Acid	412	None
Global Crossing North American Networks	1	Sulfuric Acid	17	None
Rice Enterprises D/B/A Interstate Battery	1	Sulfuric Acid	14	None
Level 3 Communications	6	Sulfuric Acid (6)	77	None (6)
MCI	1	Sulfuric Acid	1	None
Neff Rental	1	Sulfuric Acid	10	None
Peddie Chemicals	1	Sulfur Dioxide (1)	219	None
		Chlorine (1)	13,226	TCC & Lively
Qwest Communications	1	Sulfuric Acid	3	None
Rental Service Corporation	1	Sulfuric Acid	16	None

Table 2.205 (Continued)

Facility Owner	Number of Sites	EHS	Vulnerable Populations	Critical Facilities
Row Utilities LLC	6	Chlorine (6)	5,188	None (3); Day Care Centers (1); Schools (1); Group Home; Medical (1)
Sam East INC - Corporate Compliance	1	Sulfuric Acid	200	None
Sears Roebuck and Company	1	Sulfuric Acid	32	None
Talquin Electric Cooperative	23	Chlorine (23)	23,745	None (14); Day Care Centers (4); Schools (4); Group Home (1)
Unisource Worldwide	1	Sulfuric Acid	50	None

Source: Apalachee Regional Planning Council, 2009

Forty-four of the 85 sites are located within the City of Tallahassee limits (see Map 9). The City of Tallahassee and Talquin Electric Cooperative account for 49 sites, most of which are associated with water production wells and wastewater treatment plants. Chlorine is the most common chemical, accounting for the EHS at 56 sites followed by sulfuric acid at 29 sites. Chlorine is a greenish-yellow gas used to purify water, bleach wood pulp, and make other chemicals. For shipping purposes it is classified as a poisonous gas. It is normally shipped as a liquid, readily vaporizes to a gas, and is toxic by inhalation. A concentration of 1,000 parts per million (PPM) may be fatal after a few deep breaths. As little as 50 PPM may be dangerous after short exposure. Chlorine reacts violently with many common chemicals and poses a firefighting hazard in that it may combine with water or steam to produce dangerous hydrochloric acid. Sulfuric acid is a colorless, oily liquid used in the manufacture of fertilizers and other chemicals. In liquid form it is corrosive to metals and organic tissue. Sulfuric acid emits highly toxic fumes when heated and inhalation may lead to severe lung damage. It reacts violently with water. Vulnerable populations were calculated based on the maximum of two windspeeds used to calculate a worst-case scenario release. If the vulnerability zones were combined for all facilities they would encompass the entire county. Critical facilities vulnerable to exposure included hospitals, public schools, universities, group homes and day care centers. The fixed facility study reports no history of accidents and a low probability of release for all facilities, with the exception of potential valve leakage at roughly half the sites.

Small Quantity Generators of Hazardous Waste

The Department of Environmental Protection (DEP) Small Quantity Generator (SQG) Assessment, Notification and Verification Program regulates small generators of hazardous waste within the state. Facilities that produce less than 2,205 pounds of regulated waste or greater than 2.2 pounds of acute (cyanide, arsenic, etc.) hazardous waste in any one month are

classified as SQGs. Those facilities producing less than 220.46 pounds in any one month are considered conditionally exempt and are not required to meet manifesting requirements or dispose of their waste at a permitted Resource Conservation and Recovery Act (RCRA) facility. The majority of facilities are conditionally exempt, thus fall into this less intensely regulated category. Counties are required to have 20 percent of their SQGs inspected annually. The sheer number of facilities precludes annual inspections of all active facilities; therefore, it is impossible to perform an analysis that is up-to-date and comprehensive of all SQGs in Leon County. Information was collected on the last four survey cycles for which data was complete (FY 2004/05 – 2007/08) in an attempt to provide some insight into the types and approximate magnitudes of waste being generated at this scale. The totals for this period are only approximations, as facilities are constantly entering and leaving the program by the loss and/or creation of commercial businesses.

SQGs produce a variety of wastes. The Department of Environmental Protection currently reports 1,188 active facilities during FY 2007 - 2008 producing 8,627,614 pounds of waste.. An active facility is one that is recorded as producing a particular type of waste, thus any one facility may be considered “active” for multiple wastes. Therefore, the number of active facilities cannot be interpreted as the total number of facilities producing waste. Table 2.206 provides a summary listing of the number of active facilities and amounts of SQG hazardous waste generated within Leon County over the five-year period Detailed data describing the types and amounts of waste produced by Leon County SQGs during this period can be found in Technical Appendix G.

Table 2.206. Summary Leon County Small Quantity Generator Data, 2004 – 2008.

SQG Information	FY 2004 - 2005	FY 2005 - 2006	FY 2006 - 2007	FY 2007 - 2008	Total (FY 2004 - 2008)
Number of Active Facilities	471	407	404	491	1773
Pounds of Waste Produced	1,373,628	2,375,078	4,216,804	662,104	8,627,614

Source: Florida Department of Environmental Protection, 2009

A final consideration for waste generated in small quantities is the type of disposal. Florida DEP reported 8,629,530 pounds of waste disposed. Using small quantity generators between 20004 and 2008. Three of the 24 disposal methods accounted for over 92 percent of total waste: Universal Waste (39.6 percent), Used Oil Recycling (31.3 percent) and Exempt Recycling (21.2 percent). A small amount (3.2 percent) was disposed of by methods that could potentially cause environmental harm or endanger public health, such as: Onsite Land Disposal, Solid Waste Lined Landfill, Disposal to Sewer, Evaporation, Open Burn, C&D Unlined Landfill, Disposal to Surface Water and Disposal to Septic Tank. However, a more in depth analysis is needed in order to assess the actual threat imposed by these less desirable disposal methods. Table 2.207 provides a summary of SQG waste disposal methods. Detailed yearly data describing Leon County SQGs disposal methods and amounts of waste disposed during this period can be found in Technical Appendix G.

Table 2.207. Leon County SQGs by Disposal Methods, 2004 – 2008.

Disposal Method	Total	
	Active Facilities	Pounds
Universal Waste	337	3,418,819
Used Oil Recycling	443	2,702,188
Exempt Recycling	132	1,830,827
Lined Landfill	154	180,257
Onsite Exempt Treatment	55	115,229
HW Recycling	106	95,987
HW RCRA Treatment	111	95,515
Disposal to Surface Water	1	83,400
Comm. Laundry	81	51,824
CESQG Collection	131	10,996
Used Oil Burner	4	10,286
Disposal to Sewer	10	9,715
Onsite Recycle/Reuse	6	8,272
No Management Plan	67	4,551
Awaiting Disposal - Planned	84	3,811
WTE Facility	4	3,631
Mixed with Used Oil (CESQG)	16	1,354
Evaporation Only	12	1,349
Questionable	7	1,161
HHW Center	1	152
Open Burning	4	113
Disposal to Septic Tank	1	50
C&D Landfill	3	42
Onsite Land Disposal	2	1
Total	1,772	8,629,530

Source: Florida Department of Environmental Protection, 2009

Large Quantity Generators of Hazardous Waste

Leon County currently has eleven Large Quantity Generators (LQGs) of hazardous waste. An LQG is defined as a facility producing greater than 2,205 pounds of waste in any one month. These facilities are required to undergo annual inspection. Data on LQG waste generation between 2001 and 2007 was provided by DEP. Solutions, L.L and Safety-Kleen Systems were the two largest generators of waste. Table 2.208 describes the tons of waste produced by each large quantity generator in Leon County.

Table 2.208. Tons of Waste Produced by LQGs (2001 - 2007).

Generator	2001	2003	2005	2007	Total
Bayliner Marine Corporation	4.389	0	0	0	4.389
City of Tallahassee (includes Hopkins Power Plant)	0	0	0	0	0
Exxon Corporation	0	0	0	0	0
Florida Department of Environmental Protection	27.232	0	104.755	134.928	266.915
Florida Department of Environmental Regulation	0	0	0	0	0
Florida State University	24.279	26.233	99.614	136.726	286.852
Randolf's Alterations and Cleaners	0	5.5	0	0	5.5
Safety-Kleen Systems Inc.	139.424	13.898	96.543	117.11	366.975
Stanadyne Automotive Corporation	0	0	0	0	0
Texaco Service Station	0	0	0	0	0
Veolia es Technical Solutions, L.L.	103.285	55.818	81.873	82.954	323.93
Total	298.609	101.449	382.785	471.718	1254.561

Source: Florida Department of Environmental Protection , 2009

Between 2001 and 2007, LQGs in Leon County produced approximately 1,237.1 tons of waste. The two type of waste produced in the largest amounts during this period were concentrated non-halogenated solvent and contaminated debris. Table 2.209 displays the types of waste generated by large quantity generators in Leon County between 2001 and 2007.

Table 2.209. Large Quantity Generators by Type of Waste (2001 - 2007).

Waste Type	2001	2003	2005	2007	Total
Concentrated Non-halogenated Solvent	136.17	19.28	78.09	111.75	345.30
Contaminated Debris	3.74	2.64	88.64	125.66	220.68
Metal Salts or Chemicals not containing Cyanides	0.00	54.90	60.00	77.13	192.03
Other Inorganic Solids	0.63	5.77	0.00	121.62	128.02
Electrical Devices	86.73	0.00	15.14	0.00	101.87
Contaminated Soil	0.00	0.00	95.99	0.03	96.02
Oily Sludge	5.58	3.76	15.14	7.10	31.57
Concentrated Halogenated Solvent	15.19	4.01	5.72	3.11	28.02
Lab packs with No Acute Hazardous Waste	3.44	6.23	8.99	7.81	26.46
Paint, ink, lacquer, or varnish (fluid, not dry or sludgy)	5.12	1.37	4.80	2.65	13.94
Lab packs containing Acute Hazardous Waste	0.55	1.81	3.38	3.41	9.15
Other Organic Liquid	4.00	0.00	0.20	3.62	7.81
Filters and Solid Absorbents	0.00	0.00	4.48	2.55	7.03
Concentrated Halogenated/ Non-halogenated Solvent Mixture	5.81	0.00	0.00	0.00	5.81
Reactive or Polymerizable Organic Liquids and Adhesives	4.39	0.00	0.00	0.00	4.39
Acidic Aqueous Wastes	0.92	0.54	1.34	0.35	3.15
Other Aqueous Waste or Wastewaters	1.35	0.00	0.00	1.57	2.93
Cyanide or Metal Cyanide bearing Solids, Salts or Chemicals	2.50	0.00	0.00	0.00	2.50
Cyanide-bearing Sludges	2.50	0.00	0.00	0.00	2.50
Waste Oil	0.74	0.00	0.00	1.27	2.01
Paint thinner or petroleum distillates	0.28	0.24	0.19	0.36	1.06
Batteries and Battery Parts	0.00	0.00	0.00	1.06	1.06
Aqueous Waste containing Cyanides	1.00	0.00	0.00	0.00	1.00
Other Organic Solids	0.62	0.00	0.00	0.13	0.74
Compressed Gases (any type)	0.20	0.00	0.00	0.55	0.74
Very Dilute Aqueous Waste containing more than 99% water	0.00	0.00	0.69	0.00	0.69
Caustic Aqueous Waste without Cyanides	0.38	0.00	0.00	0.00	0.38
Pesticide Solids	0.23	0.00	0.00	0.00	0.23
Waste Liquid Mercury (metallic)	0.00	0.00	0.00	0.02	0.02
Total	282.05	100.53	382.79	471.72	1237.08

Source: Florida Department of Environmental Protection, 2009

Table 2.210 lists the tons of waste disposed by Leon County LQGs since 2001. Over one-third of total wastes generated during this period were disposed of through storage, bulking, or were transferred off-site. Details of off-site disposal locations were not included in the data provided by the Florida DEP. However, most of the waste leaves Leon County and is shipped to other parts of the state or out of state for disposal. This table may be helpful in gaining a basic understanding of the average amount and disposal methods for LQG waste in the county. Storage, transfer off-site, solvents recovery and incineration are the most frequently used waste disposal methods within Leon County.

Table 2.210. Tons of Waste Disposed by LQGs (2001 - 2007).

Disposal Method	2001	2003	2005	2007	Total
Storage, Bulking, and/or Transfer Off-site	58.01	31.13	144.89	164.95	398.98
Solvents Recovery	133.64	10.04	65.81	85.76	295.25
Incineration	0.20	0.00	91.00	0.00	91.20
Land Treatment	0.00	0.00	0.00	75.54	75.54
Metals Recovery	37.40	1.79	17.62	4.11	60.93
Fuel Blending	13.90	3.41	26.54	14.30	58.14
Landfill	0.00	0.60	0.00	32.88	33.48
Stabilization or Chemical Fixation prior to Disposal Off-site	0.05	0.00	0.00	0.00	0.05
Total	243.20	46.97	345.86	377.54	1013.57

Source: DEP, LQG Assessment, Notification and Verification Program, 1999.

Hazardous Material Spills

Hazardous material spills are reported to the State Emergency Response Commission at DCA and recorded in the Hazardous Materials Information System (HMIS) database. For the purpose of this analysis, data was provided by the Apalachee Regional Planning Council for Leon County from 2005 through May of 2009. A total of 162 incidents were reported for this time period resulting in the known discharge of roughly 33,354 pounds of hazardous materials resulting in 53 injuries and the evacuation of 107 people. There were no incidents resulting in fatalities between 2005 and May 2009. Injuries were likely the result of vehicular accidents rather than exposure to hazardous materials. Table 8.6 provides a summary of hazardous material spills for this period.

Table 2.211. Leon County Hazardous Materials Spill Summary (2005 - 2009¹).

<i>Material</i>	<i># Incidents</i>	<i>Amt. (lbs)</i>	<i>Evacuees</i>	<i>Injuries</i>	<i>Deaths</i>
Petroleum-based ²	99	> 2800	6	0	0
Natural Gas	31	Unknown	3	0	0
Unknown Chemical	1	Unknown	0	0	0
Propane	7	Unknown	0	0	0
Paint	1	Unknown	0	0	0
Methanol/ Nitric Acid	1	.01-03/ .01-03	0	3	0
Chlorine	1	10	0	0	0
Sodium Hypochlorite	4	Unknown	19	13	0
Polychlorinated Biphenyls (PCBs)	1	975	0	0	0
Sodium Hydroxide	1	Unknown	0	0	0
Ethylene Glycol	2	46	0	14	0
Lithium Aluminum Hydride	1	Unknown	60	1	0
Silicone Sealant	1	Unknown	0	0	0
Tar	1	Unknown	0	0	0
Benzene	1	Unknown	0	0	0
Trimethyl	1	Unknown	0	0	0
Phosphoric Acid	2	Unknown	9	12	0
Mineral Oil	1	293	0	0	0
Nitrogen Dioxide	1	Unknown	0	0	0
Oxygen	1	Unknown	0	0	0
Mercury	2	0.04	0	0	0
Ammonia	1	Unknown	10	10	0
Total	162	33,354 (known lbs.)	107	53	0

¹ Only current through May 2009

² Includes propane, gasoline, diesel, oil, kerosene, mercaptan and hydraulic fluid.

Source: Apalachee Regional Planning Council, 2009

Slightly more than 61 percent of these incidents involved petroleum-based substances, such as gasoline, diesel, oil or hydraulic fluid spills. Transportation related incidents accounted for more than 41 percent of known sources and included automobile accidents in which small amounts of gas or oil were released.

Transportation of Hazardous Materials

As previously noted, transportation related incidents are a major cause of the release of hazardous material. The county is crossed by several major highways and a freight rail line that provide access for the shipment of hazardous substances. In addition, Tallahassee's regional

airport presents another opportunity for a transportation-related disaster involving hazardous material. See Map 10 and 11 for locations of these facilities. Table 8.7 presents transportation related spill incidents by source and type of material from 2005 – 2005 in Leon County.

Table 2.212. Transportation-related Hazardous Material Spills 2005-2009.¹

Hazardous Material	Number of Incidents by Type					
	Pipeline ²	Vehicle Incident	Airplane	Train	Unspecified	Total
Petroleum ²	0	47	2	2	1	52
Natural Gas	8	0	0	0	0	8
Ethylene Glycol	0	2	0	0	0	2
Sodium Hypochlorite	0	1	0	0	0	1
Silicone Sealant	0	1	0	0	0	1
Tar	0	1	0	0	0	1
Nitrogen Dioxide	0	1	0	0	0	1
Paint	0	1	0	0	0	1
Total	8	54	2	2	1	67

Source: Apalachee Regional Planning Council, 2009

¹ Only current through March 1999.

² Includes gasoline, diesel, oil, kerosene, and hydraulic fluid.

Of the 67 transportation related spills during this period, nearly 81 percent were vehicle incidents. Eight incidents involved pipeline transport, which included only natural gas. Two incidents involving trains were reported, as well as two incidents at the airport. Only one transportation incident type was unknown. Petroleum products, such as diesel fuel, gasoline and oil accounted for nearly 78 percent of all spills. Chemical spills represented a small percentage of total spills, with only five EHS incidents reported involving minor amounts ethylene glycol, sodium hypochlorite, silicone sealant, and nitrogen dioxide. The data suggests that hazardous material spills frequently involve the transportation of these substances and that responders are most likely to find themselves addressing a petroleum spill incident along county roadways.

Commercial Transport of Hazardous Materials

In March of 1996, the District II Local Emergency Planning Committee (LEPC) conducted a study of the transportation of hazardous materials through the Apalachee Region. The study included historical accident data, a highway placard survey on major transportation routes and an analysis of rail transport data in order to determine which hazardous materials first responders are likely to encounter in the event of accident. In 1999, the Apalachee Regional Planning Council updated the Hazardous Materials Commodity Flow Study for the Apalachee Region. Detailed information specific to Leon County was not included in the reported results. In Fall 2009, the Apalachee Regional Planning Council will undertake a new Hazardous Materials Commodity Flow Study for Leon County. This new Commodity Flow study will result in new highway placard survey data and new information regarding hazardous materials transported

through Leon County by commercial vehicles and railroad. The following data will be updated when the 2009 Hazardous Materials Commodity Flow Study has been completed.

Although the historic spill data reveals that the county has not experienced a serious threat to public health from the release of hazardous materials during transport, the potential for such an emergency remains. The LEPC Regional Hazardous Material Commodity Flow Study indicates that significant amounts of hazardous substances move along the County's major transportation corridors. The study's placard survey involved recording information from the diamond-shaped signs affixed to all vehicles transporting hazardous commodities along primary transportation routes. In Leon County this involved data collection at one location (Ochlockonee Rest Area) along I-10, and two locations on US 27 (one mile N. and 1/2 mile S. of I-10). Observations occurred on two separate days from 1 to 4 hours anywhere from 10:30 am to 3:45 p.m. Information was collected on the types of chemicals transported, direction and route of travel, carrier name, date and time of observation and type of vehicle. The results are displayed in Table 8.8 below.

Table 2.213. 1996 Highway Placard Survey Results.

Chemical Name	US 27	I-10	Total
Flammable Liquid (incls. Gasoline and Methylalcohol)	14	11	25
Combustible (incls. Naptha)	5	3	8
Corrosive (incls. Sulfuric Acid)	0	3	3
Explosive (Ammonium Nitrate)	0	1	1
Liquid Hazardous Waste	0	1	1
Poison Gas (Chlorine)	0	1	1
Flammable Gas (LP Gas)	1	0	1
Total	20	20	40

Source: LEPC Regional Hazardous Material Commodity Flow Study, 1996.

Class 3 Flammable Liquids constituted the majority of commodity sitings and include any liquids with low flashpoints (<140 degrees F). Twenty-one of the Class 3 commodities were identified as gasoline. Combustible chemicals were the next most common siting and included at least one tanker of Naptha. Only one EHS (chlorine) was specifically identified during the study, although the Corrosive category may have included trucks with sulfuric or nitric acids. Even though the quantities hauled by individual transport vehicles were not determined, it is useful to note that a fully loaded tanker truck carries approximately 9,000 gallons of gasoline, 10,000 gallons of liquefied petroleum gas or 4,000 gallons of acid. A 1/2 mile buffer along the primary roadways and the airport indicates a potential vulnerable population of 171,459 and 99,482, respectively.

Leon County supports a freight railroad operated by CSX Transportation. The line bisects the County in an east-west direction, passing through the heart of downtown. Another section splits off from the main line prior to crossing Capital Circle West and runs north toward Gadsden County. CSX performed a hazardous materials density study for 1995, which identified the top ten hazardous commodities shipped along their lines in District II. Roughly 17,800 rail cars moved hazardous material between Cottdale in Jackson County and Tallahassee, 6,000 between the FL/GA border and Tallahassee, and another 21,400 between Tallahassee and Drifton

in Jefferson County. Each car is capable of holding approximately 20,000 gallons of product. Table 8.9 displays the rail traffic of these top hazardous commodities for the three CSX routes passing through Tallahassee.

Table 2.214. Top 10 Chemicals Shipped along CSX Routes in 1995.

Chemical	Total Rail Cars by Route		
	Cottondale (Jackson Co.)- Tallahassee	FL/GA Line- Tallahassee	Tallahassee- Drifton (Jefferson Co.)
Molten Sulfur	3,853	4,887	8,529
Sodium Hydroxide	3,589	270	3,337
LP Gas	2,793	1	2,822
Carbon Dioxide	978	0	978
Chlorine	819	154	609
Sulfuric Acid	562	4	638
Anhydrous Ammonia	604	80	524
Styrene	403	0	403
Ammonium Nitrate	358	503	8
Hydrochloric Acid	345	0	345
<i>Total</i>	14,304	5,899	18,193
% Hazardous Chemicals	80	98	85

Source: LEPC Regional Hazardous Material Commodity Flow Study, 1996.

Molten sulfur, sodium hydroxide and LP gas were the most frequently shipped commodities along the Cottondale and Drifton routes. Ammonium Nitrate, molten sulfur and sodium hydroxide were the most common on the FL/GA Line. Three EHS's (chlorine, sulfuric acid and anhydrous ammonia) were frequently shipped by rail along all three routes. To better grasp the magnitude of the most dangerous substances moved by rail, consider that the cars moving between Cottondale and Tallahassee alone contained approximately 212,940,000 pounds of chlorine, 168,600,000 pounds of sulfuric acid, and 72,480,000 pounds of anhydrous ammonia. Rail transport of hazardous materials poses a very real threat to public health given the extreme toxicity of commonly shipped substances, their mode of transmission upon release (airborne), the magnitude transported and the close proximity of population to the rail lines. A 1/2 mile buffer along the CSX lines includes a potential vulnerable population of 63,395. Fortunately, local emergency management personnel recognize the potential danger and are working to improve public education efforts, and facilitate coordination between public sector response agencies and private sector transportation firms. Importantly, the LEPC reports that CSX Transportation is a leader in the industry in terms of chemical transportation safety.

Hazardous Materials Response Issues

As of May 2009, only four hazard materials response teams serve all of north Florida. These teams are based in Okaloosa County, Panama City, Tallahassee and Jacksonville. Several high profile incidents, which required teams to travel up to 75 miles, have served to highlight the challenge of responding to the hazardous material response needs of rural areas. The Tallahassee Fire Department (TFD) is the only team between Jacksonville and Panama City. While the North

Florida and Apalachee regions are sparsely populated, several major transportation routes run through the area that are used to move hazardous materials. If two traffic accidents involving hazardous materials were to occur in disparate locations, the resources of the TFD could easily be stretched beyond their capacity to effectively respond. The TFD is scheduled to undergo an assessment of their capacity to serve as a Regional Hazardous Materials Response Team. The assessment will help determine the equipment, personnel and training needs that are essential for TFD to adequately serve the hazardous material response needs of the region.

Hazardous Materials Vulnerability Analysis

Leon County and the City of Tallahassee are highly vulnerable to exposure to hazardous materials, largely because of the quantities transported through the county by truck and rail. The numbers of large and small quantity generators are significant, and correlated with the ranges of services and manufacturing in county's economy. These generators are registered with the FDEP and have control plans in place in accordance with permit procedures, and the City is equipped to address spills and accidental releases. The numbers of generators and range of materials handled may be expected to increase proportionately with population and general economic growth.

2.20 Terrorism

Under the Homeland Security Act of 2002, terrorism is defined as activity that involves an act dangerous to human life or potentially destructive of critical infrastructure or key resources, and is a violation of the criminal laws of the United States or of any State or other subdivision of the United States in which it occurs, and is intended to intimidate or coerce the civilian population or influence a government or affect the conduct of a government by mass destruction, assassination, or kidnapping. See Section 2 (15), Homeland Security Act of 2002, Pub. L. 107-296, 116 Stat. 2135 (2002).

In analyzing the vulnerability of the community to domestic terrorism, it is important to separate criminal activities from terrorist activities. Generally speaking, terrorist activities involve the use or threat of terror to achieve an objective, often a political objective. Criminal activities, on the other hand, are illegal activities that are not primarily based on the use or threat of terror to achieve their objectives. A better representation of this distinction might be the use of indiscriminate use of explosives to highlight a cause, versus the use of explosives to open a safe as part of a burglary. While this distinction may be not be important to persons responding to these incidents (such as fire fighters at an explosion), it is important to consider when developing policies dealing for with terrorist activities.

Historical Occurrences of Terrorist Attacks

There has been only one instance of a domestic terrorist attack in Leon County. In 1999, an individual detonated two pipe bombs in restrooms of the Florida Agricultural and Mechanical University (FAMU) campus. No one was injured in either incident. Since 9-11, however, there has been an increased emphasis on the potential for domestic terrorist incidents. For the same reasons that Tallahassee is a potential target for civil unrest, it is also a target for domestic terrorism. Due especially to the large state government influence (and to a much lesser extent, federal government influence), the possibility of a terrorist incident is a distinct possibility. The FAMU incidents aside, Leon County does not have a history of terrorist activities, and the broad, long-term terrorist threat is difficult to accurately assess. Instead, it is more likely that terrorist activities in Leon County and the City of Tallahassee will be in response to individual incidents. Examples of individual incidents might include a high interest or controversial court case being held at the Federal Courthouse, a copycat bomber at FAMU, or a response to state legislative actions.

Terrorism Vulnerability Analysis

Leon County and the City of Tallahassee are considered vulnerable to a terrorist attack. Terrorist attacks are most likely to occur in the City of Tallahassee as opposed to the unincorporated areas of Leon County. However, in the event of a biological or chemical attack on a target in the City of Tallahassee, residents in the unincorporated areas of Leon County have the potential to be affected. However, residents in the City of Tallahassee and Leon County are considered to be at low-risk for terrorist attacks.

There are a number of high-capacity community centers and government buildings that could be potential targets for terrorist attacks. Table 2.215 below lists structures that have been identified as potential targets for terrorist attacks. All identified structures are within the City of Tallahassee jurisdiction. The two largest structures are Doak Campbell Stadium at Florida State University, which has a seating capacity of approximately 83,000 persons, and the Tallahassee-Leon County Civic Center, which has a seating capacity of approximately 13,000 persons.

Table 2.215. Structures Identified as Potential Targets for Terrorist Attacks in Leon County, 2009.

Structure	Estimated Value, 2008
Florida Capitol Building	\$134,197,257
Leon County Courthouse	\$66,810,047
Florida Supreme Court	\$22,938,019
Tallahassee-Leon County Civic Center	\$97,930,930
Doak Campbell Stadium	\$423,815,217

Source: Tallahassee Leon County Planning Department, 2009

In recognition of the potential threat posed by terrorist attacks, the Leon County Division of Emergency Management has developed a Terrorism Response Plan, which was integrated into the Leon County CEMP in 2007. The Terrorism Response Plan is a consequence management plan for preparing for, responding to and recovering from a terrorist-initiated incident, particularly one involving Weapons of Mass Destruction (WMD) or CBRNE.

2.21 Leon County Critical Facilities

Critical facilities are providers of goods or services that are key to local response functions in the event of a disaster. Critical facilities also play a vital recovery role during the aftermath of a destructive storm. Table 2.216 summarizes the types and number of high priority critical facilities within Leon County. There are a total of 610 high priority critical facilities within Leon County, 91 of which are hazardous material sites.

Table 2.216. Leon County Critical Facilities by Type and Jurisdiction, 2009.

Critical Facility Type	Total Number of Sites	City of Tallahassee	Unincorporated Leon County
Communications Towers	158	90	68
Child Care Facilities (Pre-K)	112	93	19
Hazardous Materials Sites	91	51	40
Health Care Facilities	59	52	7
Schools (K-12)	51	42	9
Public Water Supply (Wells & Tanks)	47	22	25
Emergency Shelter	46	41	5
Fire Stations	21	10	11
Hurricane Shelter	14	9	5
Sewage Treatment Facility	6	2	4
Solid Waste Facilities	6	0	6
Law Enforcement	6	6	0
Educational Facilities (Collegiate / Adult Ed)	5	5	0
Corrections	3	3	0
Hospital	2	2	0
Electric Generation / Power Plant	2	0	2
Government Center	2	2	0
Emergency Operations Center	1	1	0
Total Number of Critical Facilities	632	431	201

Source: Leon County Sheriff's Office, Division of Emergency Management, 2009

In previous updates to the Tallahassee-Leon County LMS, the locations of existing critical facilities were mapped. After discussion with local emergency management officials, the LMS Committee has decided to withhold publishing the location of Leon County high priority critical facilities in the current LMS update. Since the events of September 11, Leon County, like many local governments, has tried to restrict public access to sensitive local information, including the location of hazardous material facilities and high priority critical facilities. This is a measure to reduce Leon County's vulnerability to domestic and international terrorist attacks and protect the community. Given that the LMS is a public document that will be available to the public through local municipal government websites, the LMS Committee has elected to exclude information that would reveal the location of these critical facilities. The 2008 FEMA Local Multi-hazard Mitigation Planning Guidance does not require the mapping of critical facilities. Page 29 of this document specifies, "Even though maps are generally not required, FEMA recommends the use of maps to illustrate risk assessment information." Given this guidance and the security implications of mapping existing and new critical facilities, the Tallahassee - Leon County LMS instead presents in tabular form only the types and numbers of existing high priority critical facilities located in Leon County.

Critical Facilities in Hazard Areas

In addition to an assessment of the numbers and types of high priority critical facilities located with the jurisdictions of Leon County, analysis was conducted to determine the number of critical facilities located in identified flood and storm surge hazard areas. Table 2.217 lists the number of high priority critical facilities in Leon County located within hazard areas considered vulnerable to storm surge from hurricanes, and Table 2.218 describes the type and number of Leon County Critical Facilities located within the FEMA 100-year flood zone.

Table 2.217. Leon County Critical Facilities Located in Storm Surge Hazard Areas, 2009.

Facility Type	Storm Surge Zones		
	Category 3	Category 4	Category 5
Child Care Facility	4	5	5
Communications Tower	1	2	3
Fire Stations	0	1	1
Hazardous Materials Sites	0	1	2
Public Water Supply (Wells)	0	1	2
Solid Waste Facility	1	1	1
Total	6	11	14

Source: Tallahassee-Leon County GIS, 2009

Table 2.218. Leon County Critical Facilities Located within FEMA 100-year Flood Zone, 2009.

Facility Type	Number of Facilities
Child Care Facility	7
Communications Tower	10
Hazardous Materials Sites	3
Healthcare Facility	1
Public Water Supply (Wells)	1
Schools (K-12)	1
Total	23

Source: Tallahassee-Leon County GIS, 2009

In total, fourteen critical facilities within Leon County are considered vulnerable to storm surge from Category 3 –5 hurricanes. Five of the vulnerable critical facilities are childcare facilities. No healthcare facilities are considered vulnerable to storm surges produced during hurricanes. Twenty-three critical facilities are located within the FEMA 100-year flood zone. Ten of the vulnerable critical facilities are communications towers, and seven are childcare facilities. Only one healthcare facility is located within the FEMA 100-year flood zone.

2.22 Municipal Risk and Vulnerability Analysis

Residents of Leon County are at risk to a variety of natural and technological hazards. High-risk events involve severe weather, including tropical storms, hurricanes, and wildland fires. The county's inland location, while a buffer against the worst storm impacts, does not offer complete protection from potentially dangerous and damaging high winds and floods. MEMPHIS vulnerability analysis results predict that a Category 3, 4 or 5 storm could produce multi-billion dollar damages from winds and flooding, particularly to residential structures. For more vulnerable structures, such as mobile homes, significant damages appear even under tropical storm conditions. In a tropical storm or hurricane, the higher elevated, northern portion of the county, including Tallahassee, will bear the brunt of the high winds. In the southeast areas flooding from storm surge could also be a problem. However, flooding is not limited to tropical storm or hurricanes. Wildfires are also a significant risk to Leon County residents. With an abundant fuel source, there is the risk that a wildfire will spread to large areas of the county. This risk increases during dry periods.

Medium risk hazards include tornadoes, flooding, thunderstorms and hail, droughts, pandemic influenza and hazardous materials. Various areas of the county are susceptible to flooding from the heavy rains that are typical during the summer. Flooding is the most common hazard facing Leon County and affects more residents, on average, than any other event. With limited agriculture and an abundant supply of groundwater, droughts are not a serious hazard issue for Leon County, except as it relates to wildfires. With nearly 100 fixed facilities containing extremely hazardous substances, numerous facilities generating hazardous wastes, and the daily road and rail transport of hazardous cargo, nearly every area of the county is susceptible to a hazardous material incident. Fortunately, the County's historic experience indicates that the accidental release of these materials is rare.

Dam failure appears to pose a limited threat. The C.H. Corn Hydroelectric dam has a regular maintenance and inspection program and is not likely to experience a failure. The county's numerous earthen dams are more loosely monitored and may pose more of a threat, although little is currently known about their true risk. Due to large amounts of karst topography, nearly the entire county is susceptible to sinkhole development, although the risk is greatest around large water bodies and in the southern portion of the county. While sinkholes are an unpredictable threat to property, little can be done to mitigate against them. Terrorism is no more of a hazard issue for Tallahassee than other capital cities. Tsunamis, earthquakes, and southern pine beetle infestations currently pose a low-risk to residents. Leon County is not considered vulnerable to volcanic activity.

Chapter 3 – Mitigation Strategy

3.1 Overview of Mitigation Strategy

This section discusses the process employed to evaluate and update the previously adopted Hazard Mitigation Goals and Objectives and related Hazard Mitigation Initiatives. The current update to the LMS resulted in significant changes to the prioritized list of Hazard Mitigation Initiatives. The procedures used to update these elements of the Mitigation Strategy are discussed in the following sections.

3.2 Participation in the National Flood Insurance Program (NFIP)

According to a recently published report²⁴, the National Flood Insurance Program (NFIP) plays a major role in efforts to reduce both flood losses to property and the loss of natural floodplain functions. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968 and made major changes to the program in 1973, 1994, and 2004. The NFIP's creation was based on the federal government's consideration of several factors, including the high cost of floods to property owners and to federal, state, and local governments.

NFIP Purpose:

1. Decrease the risk of future flood losses,
2. Reduce the costs and adverse consequences of flooding,
3. Reduce the demands and expectations for disaster assistance after floods, and
4. Preserve and restore the natural and beneficial values of floodplains.

Both Leon County and the City of Tallahassee participate in the NFIP. New FEMA flood maps depicting Flood Insurance Rate Map (FIRM) zones and other areas of the City of Tallahassee and Leon County were in production in Spring 2009. Both the Leon County Commission and the City of Tallahassee Commission will adopt these maps by Fall or Winter 2009. This will be the third time since the late 1990s that FEMA has coordinated the production of local flood maps.

In addition to participation in the NFIP, both Leon County and the City of Tallahassee have adopted and continue to enforce minimum floodplain management regulations that help mitigate the effects of flooding on new and improved structures. Examples of these regulations and ordinances are listed below for each jurisdiction.

City of Tallahassee Land Development Code Sec. 6-11. forms the basis for establishing the areas of special flood hazard:

²⁴ "The Evaluation of the National Flood Insurance Program Final Report," October 2006. <http://www.fema.gov/library/viewRecord.do?id=2573>

“The areas of special flood hazard identified by the Federal Emergency Management Agency in its flood insurance study report for the city, dated March 16, 2005, with accompanying flood insurance rate maps and other supporting data, and any revision thereto, are adopted by reference and are declared to be part of this chapter.”

Among the requirements is Sec. 6-62(1), which requires that:

“New construction or substantial improvement of any residential structure shall have the lowest floor, including basement, elevated no lower than two feet above the base flood elevation.”

NFIP Policies in Leon County

In August 1999, 2,033 NFIP policies had been issued within the City of Tallahassee and the unincorporated areas of Leon County. Over the last ten years, the number of NFIP policies issued in Leon County has increased 88 percent. Table 3.1 displays the number of NFIP policies issued within Leon County jurisdictions and also includes the value of these policies.

Table 3.1. Leon County NFIP Policy Statistics as of January 31, 2009.

Community Name	Policies In-force²⁵	Insurance In-force²⁶	Written Premium In-force²⁷
Leon County (Unincorporated Areas)	1,551	\$347,230,600	\$722,991
City of Tallahassee	2,281	\$482,276,400	\$1,175,333
Total	3,832	\$829,507,000	\$1,898,324

Source: FEMA Policy and Claim Statistics for Flood Insurance, 2009. <<http://bsa.nfipstat.com/reports/1011.htm#FLT>>.

Leon County does not participate in the Community Rating System, which is an incentive program for communities that exceed the minimum NFIP requirements. (The incentive is up to 45% premium reductions for policyholders.) This has been due to the historically low number of residents who purchase flood insurance and the small reduction in premium value.

²⁵ Policies in force on the "as of" date of the report.

²⁶ The coverage amount for policies in force.

²⁷ The premium paid for policies in force.

3.3 Hazard Mitigation Goals and Objectives

To assist them in analyzing regional, county and municipal policies, ordinances and programs that affect mitigation the LMS Committee developed the six hazard mitigation goals, with supporting objectives, listed below. The list was developed from a review of County and City comprehensive plans, land development regulations, and the CEMP to determine those elements of the plans and regulations with mitigation implications. Please refer to Technical Appendix H for a discussion of the policy review.

These hazard mitigation goals and objectives were also critical in evaluating the proposed mitigation initiatives that are described later in this chapter. Whether or not a proposed mitigation initiative met one or more of the hazard mitigation goals were considered when prioritizing the individual mitigation initiatives. Each goal was assigned a value of five points; an initiative that supported all six goals would receive 30 points. The LMS Committee then reviewed each mitigation initiative and assigned a number of points to that initiative based on the number of mitigation goals the initiative supported. Table 3.4 lists the amount of points each initiative received for meeting hazard mitigation goals.

During the 2010 update to the LMS, the LMS Committee re-evaluated the adopted Hazard Mitigation Goals and Objectives at a meeting on April 23, 2009. Based on direction from the LMS Committee, the goals and objectives were amended to exclude the term ‘high-hazed’ and replace it with the term ‘hazard.’ After these changes were made, the LMS Committee reviewed the list and affirmed that the goals and objectives were still valid.

1. Goal: Protect human health, safety and welfare

Objectives:

- 1.1 Limit public expenditures in areas identified as subject to repetitive damage from disasters.
- 1.2 Ensure the protection of critical facilities such as prohibitions on constructing critical facilities in hazard areas.
- 1.3 Reduce or eliminate development in hazard prone areas such as floodplains.
- 1.4 Regulate non-conforming land uses particularly in areas subject to damage from disasters.
- 1.5 Encourage the removal of septic tanks and technically hazardous sites such as chemical storage facilities from hazard areas.
- 1.6 Consider the impact of hazard mitigation when conducting development review and approval.
- 1.7 Implement additional development restrictions on hazard areas.
- 1.8 Consider the use of land acquisition programs for properties subject to development that are located in hazard areas.
- 1.9 Coordinate efforts to develop and maintain current maps of regional hazards.

2. Goal: Protect economic activities within the community.

Objectives:

- 2.1 Encourage economic diversification to protect the community from hazards that may affect a single economic source.
- 2.2 Encourage programs to address repetitively damaged and vulnerable commercial structures.
- 2.3 Coordinate with the local business community in the development of existing and proposed mitigation initiatives.

3. Goal: Enhance regional mitigation efforts.

Objectives:

- 3.1 Coordinate with other government agencies to develop regional mitigation efforts.
- 3.2 Encourage hazard response training with agencies throughout the region.
- 3.3 Coordinate with other government agencies to develop regional hazard mapping procedures and processes.

4. Goal: Promote adequate and safe housing.

Objectives:

- 4.1 Encourage programs to address repetitively damaged and vulnerable residential structures.
- 4.2 Encourage the development of hazard mitigation-related building codes and inspection procedures.

5. Goal: Protect community resources, including, but not limited to, infrastructure, and environmental, recreational and historic resources.

Objectives:

- 5.1 Provide for the removal and/or relocation of damaged and vulnerable infrastructure.
- 5.2 Regulate land use, floodplains, non-point source stormwater run-off, and the design and location of sanitary sewer and septic tanks in hazard-prone areas, pursuant to rule 9J5.012(3)(c)3, F.A.C.
- 5.3 Encourage the removal of septic tanks from hazard areas.

6. Goal: Promote the community's ability to respond to a disaster in a timely manner.

Objectives:

- 6.1 Participate in the National Flood Insurance Program (NFIP) and Community Rating System (CRS).
- 6.2 Develop procedures to request limited revision of Flood Insurance Rate Map studies from the NFIP.
- 6.3 Develop procedures to address activities that can earn credit toward reduction of NFIP insurance premiums through CRS.
- 6.4 Encourage public awareness of hazards and hazard prone areas in the community.
- 6.5 Preserve the ability to evacuate hazard areas.
- 6.6 Develop policies and procedures for pre- and post-storm development.

3.4 Prioritization Procedures for Hazard Mitigation Actions

While developing the list of hazard mitigation initiatives, the LMS Committee recognized the need to prioritize the initiatives so that those initiatives with the greatest mitigation benefits were ranked over initiatives with less mitigation benefits. The criteria and measures listed in Table 3.2 were developed to assist the LMS Committee in this process. Members of the LMS Committee representing the lead agency for each initiative were given responsibility for prioritizing individual initiatives. While the potential range of scores for each initiative was a minimum of 80 to a maximum of 500 points, actual scores fell between 120 and 390 points. Due to the variation in types of initiatives, the LMS Committee decided it would be more useful to group them into high, medium or low categories as opposed to emphasizing individual scores. The score results for individual initiatives are available for review in Table 3.4. The range of scores for each grouping was established by dividing the point spread into thirds. This produced high (300-390 points), medium (210-299 points) and low (140-209 points) priority categories. This division resulted in 11 high, 8 medium and 5 low priority initiatives. Completion dates were not provided as part of the prioritization process. The LMS Committee felt that since many of the projects will depend on outside funding sources, each with their own eligibility criteria, it would be difficult to establish completion dates.

The main emphasis of the prioritization procedures is to promote initiatives that support public health and safety, protect people and protect real property in the most vulnerable areas. Points are also provided for initiatives that supported essential or critical public and private services, and previously identified mitigation goals. Implementation time was also considered. Finally, bonus points were awarded to those initiatives that provide additional benefits. The intent of these procedures is not to direct a rigid order for the accomplishment of initiatives. The purpose of the ranking is to indicate the overall importance of the project to local mitigation efforts. The implementation of an initiative will usually depend more on the availability of funds, than on how high or low it ranked compared to other initiatives.

Table 3.2: Mitigation Initiatives Prioritization Procedures.

Criteria	Measure	Points
Supports public health and safety	<ol style="list-style-type: none"> 1. Immediate - Alleviates an existing health or safety hazard 2. Intermediate - Alleviates potential health or safety hazards 3. Long-term - Promotes or maintains health or safety 	<ol style="list-style-type: none"> 1. Immediate - 100 points 2. Intermediate - 75 points 3. Long-term - 50 points <p>Maximum number of points is 100</p>
Protects people	Percentage of at risk population to benefit.	<ol style="list-style-type: none"> 1. > 75% - 80 points 2. 50-75% - 60 points 3. 25-50% - 40 points 4. 10-25% - 20 points 5. <10% - 0 points <p>Maximum number of points is 80</p>
Protects property	Percentage of at-risk buildings, property or infrastructure protected and/or ability to address a repetitive loss problem.	<ol style="list-style-type: none"> 1. Protects >50% or resolves rep. loss problem - 80 points 2. Protects 25-50% or improves rep. loss problem - 60 points 3. Protects 10-25% - 40 points 4. Protects <10% - 20 points 5. No property protection - 0 points <p>Maximum number of points is 80</p>
Reduces risk of future damage	<p>Reduces or eliminates future risk of damage to a facility and/or infrastructure based on hazard events that are:</p> <ol style="list-style-type: none"> 1. Immediate - event occur yearly (on average) 2. Significant - event occurs every 2 - 4 years (on average) 3. Moderate - event occurs every 5 - 10 years (on average) 4. Minimal - event occurs once every 11 years or more (on average). 	<ol style="list-style-type: none"> 1. Immediate - 80 points 2. Significant - 60 points 3. Moderate - 40 points 4. Minimal - 20 points <p>Maximum number of points is 80</p>

Table 3.2: Prioritization Procedures (continued)

Criteria	Measure	Points
Supports essential or critical services	<ol style="list-style-type: none"> Essential public services protected, such as gas, electric, garbage, sewer, roads, water, fire and police/sheriff, shelters, EOC, etc. Essential business services protected, such as building supply, gas, ice, banks, etc. 	<ol style="list-style-type: none"> Essential public service - 20 points Essential business service - 10 points No essential service - 0 points <p>Maximum number of points is 30</p>
Supports goals established in the Community Guiding Principles	Number of mitigation goals the initiative supports.	<p>5 points for each mitigation goal supported</p> <p>Maximum number of points is 30</p>
Ease of Implementation	Length of time to implement initiative	<ol style="list-style-type: none"> < 1 year - 60 points 1 - 2 years - 40 points 2 - 5 years - 30 points 5 - 10 years - 10 points > 10 years - 0 points
Provides benefits that are a bonus beyond those previously identified.	<ol style="list-style-type: none"> Benefits extend beyond the county boundaries. Promotes public/private cooperation. Promotes individual responsibility. Provides multi-hazard risk reduction. 	<p>10 points per bonus item.</p> <p>Maximum number of points is 40</p>
Maximum Number of Points For Any Initiative - 500		

As noted earlier, simply because a project has a high ranking does not mean that project will be funded first. The ranking indicates the overall importance of the project to local mitigation efforts. However, the grant specific funding guidelines (such as income levels, community matches, type of project, etc.) and the availability of funding will often be more important in determining which projects will be funded and when, than will the project’s overall ranking.

3.5 Current Prioritized Hard Mitigation Initiatives

In 1999, the LMS Committee began the hazard mitigation identification process by identifying existing and planned mitigation initiatives. This process included a review of the Capital Improvements Plan, applicable City and County ordinances, and hazard-related program activities. A list of these local mitigation initiatives that formed the model for the first draft of the Prioritized Mitigation Initiatives list are included in Technical Appendix I. The Working Group proposed a mix of additional mitigation programs, policies and projects to help further reduce the county’s disaster profile. Many of these initiatives have been completed, which has reduced Leon County’s and the City of Tallahassee’s vulnerability to identified hazards. Descriptions of completed mitigation initiatives have been included as a benchmark for progress in Technical Appendix D.

For the 2010 update to the LMS, the Prioritized List of Hazard Mitigation Initiatives and related scoring procedure were re-evaluated by the LMS Committee and resulted in significant changes. The statuses of mitigation initiatives were discussed in a meeting of the LMS Committee on April 23, 2009. LMS Committee staff presented a status report on each of the 45 mitigation initiatives. The status updates were derived from the annual progress report produced by the City of Tallahassee Stormwater Management Division each year, and through discussion with LMS Committee members and other local officials. After status updates on each initiative were presented to the LMS Committee and discussed among attendees, initiatives that had been completed were removed for the mitigation initiatives list. A number of initiatives were also modified given that the objectives and goals of the initiative had been partially met or completed. After discussion and evaluation of the mitigation initiatives, the LMS Committee removed 18 completed initiatives from the list; modified three initiatives based on progress and partial achievement of initiative objective; edited and condensed seven initiatives to produce three new initiatives; added one new initiative to the prioritized mitigation actions list. Status updates on all initiatives and descriptions of completed and modified mitigation initiatives have been included as a benchmark for progress in Technical Appendix D. The current Prioritized Mitigation Initiatives list includes 24 initiatives. Table 3.3 provides a description of each initiative, the agency responsible for leading efforts towards implementation and potential funding sources.

2009 Estimated Costs Ranking System

In order to assess the benefits of mitigation actions versus the cost of implementing these initiatives, an economic evaluation of mitigation initiatives was incorporated into the current LMS update. Previously, an economic evaluation of each mitigation initiative was performed by determining available funding sources for each initiative. Potential funding sources are still incorporated into the description of each mitigation initiative in Table 3.3. The addition of an estimated cost ranking system serves the purpose of assessing the potential cost of implementing each mitigation initiative. It also provides an indicator of the extent to which benefits may be maximized according to a cost-benefit review of the proposed projects and their associated costs.

²⁸The categories of the estimated cost ranking system are depicted below:

Low	\$1 - \$50,000
Medium	\$50,001 - \$250,000
High	\$250,001 and up

Estimated costs were derived through consultation with LMS Committee staff and other local officials familiar with the initiatives and related programs. LMS Committee staff met on numerous occasions to discuss aspects of each initiative and estimate costs for implementing these initiatives. Estimated cost rankings for each mitigation initiative have been incorporated into Table 3.3. Table 3.4 indicates the 2008-2009 Mitigation Funding Priorities as set by the Steering Committee for FEMA 1785-DR-FL "T.S. Fay" and FEMA-1831-DR-FL

²⁸ A full cost-benefit was not conducted of the projects and initiatives in this plan based on a lack of time and staff to do so. However, if pre- and/or post-disaster funding is pursued by local government or other institutions, a cost-benefit analysis is automatically required from all applicants.

The mitigation programs and policies identified by the LMS Committee are generally non-capital efforts, such as policy changes and updates to existing codes and plans. Many of these efforts are ongoing, and there is no explicit starting or ending time or schedule in place.

The hazard mitigation capital projects include stormwater ponds, culverts, flood warning devices, storm retrofits, and emergency response equipment purchases. For most of these efforts, the local governments will require outside funding assistance. Many of the identified projects will involve both studies and implementation of the study results.

All stormwater related projects are included under mitigation initiative 8 in Table 3.3. For a complete listing of current and future stormwater projects for both the City of Tallahassee and Leon County, please refer to Tables 3.5 – 3.9.

Table 3.3. Prioritized Mitigation Initiatives with Potential Funding Sources, 2009.

Initiative	Explanation	Specific Hazard Addressed	Estimated Costs (2009) & Timeframe	Responsible Agencies	Potential Funding (non-local source) ¹
1. Increase intergovernmental coordination in the area of stormwater management, including storm and flood monitoring, warning systems, and related data.	Stormwater does not follow jurisdictional boundaries. Land use activities in the City can affect drainage characteristics outside municipal boundaries and, to a lesser extent, vice versa. In the past, stormwater management opportunities have been constrained by fiscal concerns and the impacts of significant amounts of pre-code development. These factors necessitate strong intergovernmental coordination for stormwater management efforts to be effective. Conditions have improved, but there remains a need to continue pursuing a path of intergovernmental coordination, short of consolidating City and County stormwater operations. Opportunities for improving coordination exist in the planning, construction and maintenance of stormwater facilities, and the management of land uses in a manner that minimizes runoff impacts to downstream neighbors.	Flooding	Low/Ongoing	City and County Public Works; City and County Commissions	Not Applicable
2. Improve the disaster resistance of existing site built housing stock.	Build upon current CDBG, HOME and SHIP programs, to improve the disaster resistance of existing site built housing stock.	Flooding; Hurricane/ Tropical Storms; Tornadoes; Thunderstorms/ Hails; Urban Fire; Wildfire; Storm Surge	High/Ongoing	Tallahassee Neighborhood and Community Services, Leon County Housing and Human Services; Capital Area Red Cross	CDBG Program, SHIP, HOME, HMGP, and FMAP (DCA); Repair and Restoration of Disaster Damaged Historic Properties (FEMA); National Flood Mitigation Fund (FEMA); Em. Advance Measures for Flood Prev. (Army Corps)

Table 3.3. Prioritized Mitigation Initiatives with Potential Funding Sources, 2009.

Initiative	Explanation	Specific Hazard Addressed	Estimated Costs (2009) & Timeframe	Responsible Agencies	Potential Funding (non-local source) ¹
<p>3. Advocate that FEMA modify its policies to accommodate local floodplain management program requirements so as to avoid the frequent necessity for duplicate, and sometimes conflicting, modeling for NFIP purposes.</p>	<p>FEMA is very reluctant to fund and manage software review activities at a level necessary to facilitate needed coordination and cooperation with multi-objective local stormwater management programs. Tallahassee and Leon County have advanced stormwater regulations and require sophisticated digital modeling. FEMA is very slow to review (let alone consider approval of) new modeling software or even more current versions of previously approved software. As a result, local communities frequently are faced with having to do advanced modeling for design and local permitting and then duplicate modeling with the limited suite of FEMA-approved software for NFIP purposes. Not only is this a waste of taxpayer dollars, but frequently it results in conflicting flood stage data.</p>	<p>Flooding</p>	<p>Low/Ongoing</p>	<p>City of Tallahassee and Leon County Public Works</p>	<p>Not Applicable</p>
<p>4. Improve floodplain boundary identification and implementation of the FEMA map amendment process.</p>	<p>Efforts would focus on correcting inaccuracies in FEMA flood hazard boundaries. These boundaries are used for insurance purposes and frequently increase rates for residents that are clearly not in the floodplain. Other citizens use this information to guide property purchases and find out they are susceptible to flooding despite lying outside the hazard areas of a FIRM. This initiative would require the hiring of sufficient personnel to identify and prepare map amendments and expand the existing floodplain database to include best available information, such as permitting models, for incorporation into a GIS. Besides providing better data that could reduce insurance rates and improve decisions regarding property purchases, this information could guide acquisition efforts.</p>	<p>Flooding; Storm Surge</p>	<p>Medium/Ongoing</p>	<p>City of Tallahassee and Leon County Growth Management and Public Works; Tallahassee-Leon MIS/GIS</p>	<p>EMPA Trust Fund (DCA); Small Watershed Program (USDA); Emergency Advance Measures for Flood Prevention (Army Corps); Resource Conservation and Development Program (USDA); Soil and Water Conservation Program (USDA); National Flood Mitigation Fund (FEMA)</p>

Table 3.3. Prioritized Mitigation Initiatives with Potential Funding Sources, 2009.

Initiative	Explanation	Specific Hazard Addressed	Estimated Costs (2009) & Timeframe	Responsible Agencies	Potential Funding (non-local source) ¹
5. Explore methods to eliminate additional development in the 25-year floodplain.	This initiative aims at keeping new buildings from the highest risk area of the floodplain, and might include an acquisition effort targeting undeveloped lots.	Flooding	High/Ongoing	City of Tallahassee and Leon County Growth Management, Tallahassee-Leon County Planning	Not Applicable
6. Create a public education campaign and community program that promotes awareness of vulnerability to hazards in our community and encourage disaster preparation.	Capital Area Chapter of the American Red Cross has developed the Disaster Resistant Neighborhood Program. The program is designed to mitigate the impact of various disasters by educating residential and commercial property owners on personal actions they can take to reduce the affects of a disaster (such as removing dead limbs, putting up shutters / plywood, creating a safe room in your house/business, etc.). The City and County should adopt this program and advertise to all residents, providing technical assistance where needed. The City and County should host an annual or semi-annual disaster fair focusing on the community's vulnerability to various disasters and possible mitigation techniques. The fair could be hosted annually as a stand-alone event, and integrated into other community events throughout the year. This strategy would address creating a safe room within the home, general home protection procedures, etc.	Flooding; Hurricane/ Tropical Storms; Tornadoes; Thunderstorms/ Hail; Urban Fire; Wildfire	Low/Ongoing (for Repetitive Flood Loss Property Owners, Owners of Property in Floodplains, and Utility Billing Educational Inserts)	City of Tallahassee and Leon County Emergency Management; Capital Area Red Cross	Not Applicable EMPA Trust Fund (DCA)
7. Continue current efforts to remove dead, dying or diseased trees or branches next to roadways and power lines.	Debris from storm events poses a hazard to overhead power lines and roads. While it is current City and County practice to remove trees or branches before they cause problems, these efforts could be improved and expanded to reduce this hazard.	Hurricane/ Tropical Storms; Tornadoes; Thunderstorms/ Hail; Infestation; Winter Storm	High/Ongoing	City of Tallahassee and Leon County Public Works, City Electric Utilities and Talquin Electric,	Not Applicable

Table 3.3. Prioritized Mitigation Initiatives with Potential Funding Sources, 2009.

Initiative	Explanation	Specific Hazard Addressed	Estimated Costs (2009) & Timeframe	Responsible Agencies	Potential Funding (non-local source) ¹
8. City of Tallahassee and Leon County flood-related capital improvement projects.	Numerous stormwater projects have been identified as necessary to provide relief to existing flood problems. A complete listing of projects for both the City of Tallahassee and Leon County are included in Tables 3.5 – 3.9 at the end of this chapter.	Flooding	High/Ongoing	City of Tallahassee and Leon County Public Works	CDBG (DCA); HMGP (DCA); Emergency Bank Protection (Army Corps); STP (ISTEA); Sustainable Development Challenge Grants (EPA); National Flood Mitigation Fund (FEMA); Soil and Water Conservation (USDA); Resource Conservation and Development (USDA); Small Watershed Program (USDA)
9. Acquire parcels in the 100-year floodplain.	This initiative builds on past City/County floodplain acquisition efforts and would be enhanced by improved information developed through initiative #5. Acquisitions would target improved parcels with the most vulnerable structures.	Flooding; Storm Surge	High/Ongoing	City Stormwater; County Stormwater; Tallahassee/Leon County Planning	Florida Communities Trust; HMGP
10. Develop an emergency notification system for all hazards.	Emergency notification is essential to protecting life and property. Immediate notification to a specific area, is critical during rapidly developing situations such as tornados, hazardous material releases, and flash flooding. This system can also be used to inform residents of utilities issues such as boil water notices, power outages, sewer issues, Amber Alerts and more.	All Hazards	Medium/Ongoing	Leon County, City of Tallahassee, Emergency Management; Law Enforcement, Fire and Health.	U.S. Department of Homeland Security

Table 3.3. Prioritized Mitigation Initiatives with Potential Funding Sources, 2009.

Initiative	Explanation	Specific Hazard Addressed	Estimated Costs (2009) & Timeframe	Responsible Agencies	Potential Funding (non-local source) ¹
11. Evaluate requirements and feasibility for the County's participation in the NFIP Community Rating System.	Participation in the CRS allows communities to reduce their flood insurance premiums as compensation for flood protection efforts undertaken above NFIP requirements. Communities are assigned a ranking in a 10-tier classification system based on actions taken to reduce flooding. Each additional improvement in one's class ranking allows a 5 percent reduction in premiums.	Flooding; Storm Surge	Low/Ongoing	Leon County Emergency Management; Leon County Stormwater	Not Applicable
12. Explore the feasibility of adding a full build-out component to the Leon County Master Stormwater Management Plan	The master stormwater management plan does not take into account stormwater and flooding impacts given future build-out conditions for the entire County. This information could be used to revise existing floodplain regulations so that they reflect projected built-out conditions.	Flooding; Storm Surge	Medium/Ongoing	Leon County Growth Management, Tallahassee-Leon County Planning	EMPA Trust Fund (DCA); Small Watershed Program (USDA); Emergency Advance Measures for Flood Prevention (Army Corps); Resource Conservation and Development Program (USDA); Soil and Water Conservation Program (USDA); National Flood Mitigation Fund (FEMA)
13. City and County are to implement a program to acquire easement or fee simple land allowing access to maintain the major ditches/canals to reduce flooding.	The program would consist of the acquisition of easements for ditches and the necessary land to access the ditches so normal maintenance can be performed. Currently the City of Tallahassee is responsible for the maintenance of over 23 miles of major ditches. About 15 miles have adequate access easements, are located within an easement or are located on public ROW. Approximately 30 acres are needed to have full public access to maintain the ditches.	Flooding	High/FY 2011-2012	City Stormwater; County Stormwater;	HMGP (DCA); National Flood Mitigation Fund (FEMA)

Table 3.3. Prioritized Mitigation Initiatives with Potential Funding Sources, 2009.

Initiative	Explanation	Specific Hazard Addressed	Estimated Costs (2009) & Timeframe	Responsible Agencies	Potential Funding (non-local source) ¹
<p>14. Continue, manage, and expand flood-warning devices and systems countywide to protect developed areas, critical facilities, including the Lake Talquin Dam, and low-lying roads. This includes the existing local and regional governmental stream and river flood monitoring and warning system. Share these data government-wide for the protection of critical facilities and low-lying roads that may be affected by flooding associated with storms, hurricanes, and other natural events and/or disasters.</p>	<p>The City of Tallahassee, Leon County, and the Northwest Florida Water Management District cooperatively manage a stream gauge network within Leon County intended to provide real-time storm event information. This project is intended to provide real-time rainfall data collection to help identify potential flood conditions so that emergency responses can be initiated. The network will eventually support stream and groundwater condition gauging to further improve the flood prediction capabilities of local, state, and federal emergency staff. These capabilities are crucial to providing adequate community warning of the potential need for evacuation, as well as identifying possible flooded roads.</p> <p>This system should be expanded to protect the maximum number of critical facilities, and the most critical gauges should have the ability to transmit real-time radio telemetry. Flooding and other data associated with this system should be made easily available to all emergency and flood management agencies at all times.</p> <p>In addition, to assist motorists and residents, the City and County should also acquire flood-warning devices that would be deployed at vulnerable locations during or in advance of a flood. This project would require the City and County to evaluate and prioritize each vulnerable structure and/or locations for inclusion into a countywide automated warning system.</p> <p>Currently, there is no audible local warning system for persons living below the Lake Talquin Dam on either side of the river. City officials have a federally-approved emergency action plan that utilizes a call notification system in the event of a failure of the dam or high water events (flooding). Dam staff also provide daily operational updates via e-mail to Leon, Liberty, and Gadsden county emergency management operations staff. If federal requirements eventually mandate an upgrade to this system, staff should pursue mitigation funding to acquire the necessary infrastructure and other necessary system features, including integration into local and regional government automatic warning systems and an appropriate public education program.</p>	<p>Flooding; Storm Surge</p>	<p>Medium/Ongoing</p>	<p>City of Tallahassee and Leon County Emergency Management</p>	<p>HMGP (DCA); National Flood Mitigation Fund (FEMA)</p>

Table 3.3. Prioritized Mitigation Initiatives with Potential Funding Sources, 2009.

Initiative	Explanation	Specific Hazard Addressed	Estimated Costs (2009) & Timeframe	Responsible Agencies	Potential Funding (non-local source) ¹
15. Secure funding source for identified shuttering and hardening needs for windows at Tallahassee Memorial Hospital (TMH).	Tallahassee Memorial Hospital is highly susceptible to wind damage from a tropical storm/hurricane. Currently neither hospital has storm shutters in place. As one of the primary hospitals serving the City of Tallahassee, Leon County and the region, local emergency management personnel should work with TMH to identify shutter options and hardening needs for windows, including costs. In addition, efforts should be undertaken to identify and harden essential support facilities (such as generators) at the hospital.	Hurricane/ Tropical Storms; Tornadoes; Thunderstorms/ Hail	High/FY 2011-2012	City of Tallahassee and Leon County Emergency Management	EMPA Trust Fund (DCA); HMGP (DCA); CDBG (DCA)
16. Consider addressing the economic impact of different disaster scenarios, as information becomes available.	DCA, as part of their disaster modeling, is trying to develop an economic impact model, which may be available next year. Some data is already available through the TAOS model.	All	Low/FY2011-2012	City of Tallahassee / Leon County GIS, City County Offices of Management and Budget	Not Applicable
17. Continue to improve and expand regional response capabilities for responding to hazardous materials and terrorism events.	The possibility of an incident involving a weapon of mass destruction or a hazardous materials release exists within Leon County. County EM is preparing a response plan and now needs to identify the equipment needed to respond to effectively to an incident. In addition, the City and County need to identify potential funding sources to acquire the highly specialized, and often expensive, equipment. Tallahassee Fire Department has the only hazardous materials response unit in the region (between Alachua and Escambia Counties, and to a lesser extent, Bay County). Currently, the Fire Department will respond to hazardous materials incidents outside of the County. In the event of multiple incidents, the Fire Department's ability to respond would be severely taxed. The development of a regional hazardous materials response capability would necessitate the expansion of personnel, equipment, and training, as well as the development of local agreements.	Hazardous Materials; Terrorism; Civil Disturbance; Radiological Disaster	Medium/Ongoing	City of Tallahassee and Leon County Emergency Management	FEMA and other federal agency grants Chemical Emergency Preparedness and Prevention Grants Program (EPA); Disposal of Federal Surplus Property (GSA); Hazardous Materials Training Program (FEMA)

Table 3.3. Prioritized Mitigation Initiatives with Potential Funding Sources, 2009.

Initiative	Explanation	Specific Hazard Addressed	Estimated Costs (2009) & Timeframe	Responsible Agencies	Potential Funding (non-local source) ¹
18. Maintain training programs for emergency responders, and continue to identify new training programs as needed.	In the event of a natural disaster, hazardous material release, or other catastrophic incident, numerous emergency responders, often with widely different roles, will be required to work as a single, integrated unit. Key to this effort is training. The City and County need to continually identify the different training needs for numerous responders, including, but not limited to dispatchers, initial responders, field responders, and incident commanders. Included as part of this is a continuous training program, involving classroom training, tabletop exercises and field exercises. The effort should also address the development and implement public awareness training programs.	All	Low/Ongoing	City of Tallahassee and Leon County Emergency Management	Hazardous Materials Training Program (FEMA); Chemical Emergency Preparedness and Prevention Grants Program (EPA)
19. Continue to identify needs for improving the disaster resistance of critical facilities.	Critical facilities provide essential services in the event of an emergency, but may be housed in structures that require improvements to weather the impacts of a disaster. Improvements may include, but not be limited to, the installation of storm shutters, or gas generators.	Hurricane/ Tropical Storms; Tornadoes; Thunderstorms/ Hail; Winter Storm; Power Loss	Medium/Ongoing	City of Tallahassee and Leon County Emergency Management	EMPA Trust Fund (DCA); HMGP (DCA); CDBG (DCA)
20. Identify populations at risk under different scenarios.	Determine the impact on housing, medical, evacuation, shelters, etc., for different populations such as those attending special events, student populations, and the elderly.	All	Low/Ongoing	City of Tallahassee and Leon County Emergency Management and City of Tallahassee/ Leon County Planning	EMPA Trust Fund (DCA)
21. Encourage the establishment of community-based emergency shelters.	Subdivisions, mobile home parks, etc. that have storm shelters incorporated into their designs would provide additional sheltering capacity and eliminate the need to evacuate residents. These buildings could double as community centers.	All	Low/Ongoing	City of Tallahassee and Leon County Emergency Management	Not Applicable

Table 3.3. Prioritized Mitigation Initiatives with Potential Funding Sources, 2009.

Initiative	Explanation	Specific Hazard Addressed	Estimated Costs (2009) & Timeframe	Responsible Agencies	Potential Funding (non-local source) ¹
22. Build a single, community-wide emergency operations center.	Both the City and County maintain a separate emergency operations center (EOC). By building a single, consolidated EOC, integrating all emergency support functions, the City and County will be better prepared for pre- and post-disaster operations.	All	High/Ongoing	City of Tallahassee and Leon County Emergency Management	EMPA Trust Fund (DCA)
23. Deploy low-power public radio station covering all of Leon County.	The station would facilitate the dissemination of disaster related information to the public regarding evacuation procedures, storm forecasts, shelters, etc.	All	Low/Ongoing	City of Tallahassee and Leon County Emergency Management	Not Applicable
24. Identify major land-based transportation corridors and establish safe zones around those corridors based on the exposure pathway for different chemicals.	This would also include identification of all structures, facilities and special need populations in the corridors. Provide ready access to this information to hazardous material response personnel, preferably from deployed resources (such as a GIS capability on the hazardous response vehicle).	Hazardous Materials	Low/Ongoing	City of Tallahassee and Leon County Emergency Management	Hazardous Materials training Program (FEMA); Chemical Emergency Preparedness and Prevention Program (EPA)

Table 3.4. Mitigation Initiatives Prioritization Scores.

Initiative	Health and Safety	Protects People	Protects Property	Risk Reduction	Essential Services	Guiding Principles	Implement Time	Bonus	Total Score
Increase intergovernmental coordination in the area of stormwater management.	50	80	80	80	30	20	40	10	390
Improve the disaster resistance of existing site built housing stock.	100	80	80	60	0	15	30	20	385
Advocate that FEMA provide greater flexibility to local communities that elect to establish more accurate flood elevations.	50	80	80	40	20	30	60	10	370
Improvement in floodplain boundary identification and implementation of the FEMA map amendment process.	75	60	60	20	20	30	10	40	355
Explore methods to eliminate additional development in the 25-year floodplain.	100	80	80	20	20	20	0	20	350
Create a public education campaign and community program that promotes awareness of vulnerability to hazards in our community and encourage disaster preparation.	75	80	40	20	0	25	60	40	340
Continue to improve current efforts to remove dead, dying or diseased trees or branches next to roadways and power lines.	75	60	20	80	20	25	30	20	330
Flood related capital improvement projects.	100	60	40	40	20	30	10	30	330
Acquire parcels in the 100-year floodplain.	75	40	40	60	0	20	60	10	305
Develop an emergency notification system for all hazards.	50	80	40	20	30	15	30	40	305
Evaluate requirements and feasibility for the County's participation in the NFIP Community Rating System.	75	80	20	40	0	25	40	20	300
Explore the feasibility of adding a full build-out component to the Leon County Master Stormwater Management Plan	75	40	40	20	20	30	40	10	275
City and County are to implement a program to acquire easement or fee simple land allowing access to maintain the major ditches/canals to reduce flooding.	50	40	40	80	20	20	10	10	270

Initiative	Health and Safety	Protects People	Protects Property	Risk Reduction	Essential Services	Guiding Principles	Implement Time	Bonus	Total Score
Continue and expand program to deploy flood warning devices and systems at critical facilities and Lake Talquin Dam.	75	20	20	60	20	15	40	20	270
Secure funding source for identified shuttering and hardening needs for windows at Tallahassee Memorial Hospital (TMH).	100	20	20	20	20	15	30	30	255
Consider addressing the economic impact of different disaster scenarios, as information becomes available.	50	80	0	20	20	25	30	30	255
Continue to improve and expand regional response capabilities for responding to hazardous materials and terrorism events.	50	80	0	20	20	15	30	20	235
Maintain training programs for emergency responders, and continue to identify new training programs as needed.	50	60	0	40	30	10	30	10	230
Continue to identify needs for improving the disaster resistance of critical facilities.	75	20	20	60	20	0	30	0	225
Identify populations at risk under different scenarios.	50	20	0	60	20	0	30	10	190
Encourage the establishment of community-based emergency shelters.	50	10	0	80	0	5	30	10	185
Build a single, community-wide emergency operations center.	50	80	0	0	20	10	30	--	180
Deploy a low-power public radio station.	50	20	0	20	20	0	30	20	140
Identify major land-based transportation corridors and establish safe zones around those corridors based on the exposure pathway for different chemicals.	50	40	0	0	0	0	40	10	140

Table 3.4. 2008-2009 Mitigation Funding Priorities.

Funding Priority	Project Name or Description	Applicant	Goal/Objective Implemented	Estimated Costs
1	Joint Public Safety Complex	Leon County	Goals 1, 3, and 5 Objectives 1.2 & 3.2	\$2,136,136.94
2	Weems Road Culvert Reconstruction	City of Tallahassee	Goals 1, 2, 5, and 6 Objectives 1.1, 1.2, 5.1, and 6.5	\$1,611,461.25
3	Main Building Window Replacement	Tallahassee Memorial Hospital	Goals 1, 5, and 6 Objectives 1.1, 1.2, 5.1, and 6.6	\$738,000
4	Hurricane Shutters ²⁹	Florida State University	Goals 1, 3, and 6. Objectives 1.2, 3.1, and 6.4	\$92,716
5	Gibbs Hall Building Hardening	Florida Agricultural and Mechanical University	Goals 1, 4, and 5 Objectives 1.2, 4.1, 4.2, and 5.1	\$300,000
6	Emory Court Flood Relief	City of Tallahassee	Goals 1, 3, 5	\$2,136,136.94
Total Amount				\$9,150,588.07

Table 3.5. City of Tallahassee Drainage Improvement Project, 2008 – 2013.

The City has identified the following 16 drainage improvement projects in its current Capital Improvement Program (FY2008-2013). The estimated cost of these projects totals \$64,650,400.

Project	Cost (\$)	Prior Year	Current Status
Campus Circle Flooding	4,280,000	Completed	Completed
Central Ditch Flood Reduction	10,900,000	On-hold	On-hold
Chapel Drive	1,200,000	Design	Completed
Connie Drive Flooding	4,275,000	Under Construction	Under Construction
E Georgia & Meridian	2,575,000	Study	Design
Emory Court	9,000,000	Design	Design
Ford Street Drainage Improvements	950,000	Design	Construction
Frenchtown Stormwater Master Plan	11,645,400	Study	Design
Lafayette Park Outfall	2,200,000	Study	Design
Meginnis Creek at Sharer Road	4,725,000	Design	Construction
Northeast Ditch at Lonnbldh	1,500,000	Design	Construction
Park Ave. Tributary No. 1 Improvements	2,400,000	On-hold	Study
Pickett Court	1,000,000	On-hold	Study
Rainfall and Stream Gauging	390,000	Data gathering	Data gathering
Small Projects Initiative (see below)	4,250,000	See below	See Table 2 below
Stormwater Infrastructure Inventory and Mapping	3,360,000	Data gathering	Data gathering
Total	\$64,650,400		

Source: City of Tallahassee Stormwater Management Division, 2009

²⁹ This project was #1 in priority for FEMA-1831-DR-FL mitigation funding.

Table 3.6. City of Tallahassee Drainage Improvement Projects – Small Projects Initiative.

Project	Priority Year Activity	Status
1103 Bonnie Drive	Under Construction	Completed
2212 Eastgate Way	On hold	On hold
O'Brien and Grey Abbey Court	Under Construction	Completed
Sandhurst Drive	Future	Design
2925 Edenderry Drive	Design	Under Construction
926 Millard Street	Design	Under Construction
3449 Mahoney Drive	Study	Design
Villages of Killearn/Kinsail	Study	On Hold
2764 Faringdon Drive	Future	Study
1102 Tanner	Future	Study
3068 O'Brien Drive	Future	Future
3933 Runnymede	Future	Future
1341 Hutchinson	Future	Future
605 Putnam Drive	Future	Future
2329 Limerick Drive	Future	Future
1423 Devils Dip	Future	Future
1503 Spruce Avenue	Future	Future
519 Short Street	Future	Future
2005 Florida Avenue	Future	Future
312 & 316 Ridge Road	Future	Future
2905 Brey Court	Future	Future
1829 Ivan Drive	Future	Future
Randolph / Belleauwood /Jenette/2235 & 2243 Trescott	Future	Future
823 Ausley Road	Future	Future
510 Middlebrooks Circle	Future	Future

Source: City of Tallahassee Stormwater Management Division, 2009

Notes: All “Small Projects Initiative ” projects that are listed as “On Hold” have been recommended for construction and are awaiting implementation. SPI projects listed as “Future” are planned in the SPI program and will be implemented in the order listed.

Table 3.7. Leon County Capital Improvement Projects, 2009.

Project
Blueprint 2000 Water Quality Enhancements Lake Munson Dam Replacement Sharer Road Outfall Stabilization Lake Heritage Outfall
Bradfordville Pond 4 Outfall Stabilization
Bradfordville Pond 6 Facility Rehabilitation
Killearn Acres Flood Mitigation
Killearn Lakes Plantation Stormwater
Lafayette Street Stormwater
Lakeview Bridge
Lexington Regional SWMF
Longwood Subdivision Retrofit
Rhoden Cove Wetland Restoration
Gum Creek Flood Study
Okeeheepkee Basin - Fuller Road

Source: Leon County Public Works, 2009

Table 3.8. Leon County Stormwater and Transportation Projects, 2009.

Project
Alexandrite Court
Autumn Woods
Ben Boulevard
Edenfield/Barfield Roads Area
Edinberg Estates
Hawkbill Court
Killearn Acres III
Lakeview Drive
Lawndale Drive
Maylor and Taylor Roads
Parkhill Road
Portsmouth Circle/ Apalachee Pkwy
Raymond Tucker Road
Salamanca & Palencia Courts
Southbrooke/Otter Creek/Chadwick/Wildlife
Sunflower Road
Alford Arm @ CSX Railroad Area
Stoneler Road Outfall
Chaires Crossroad (Lafayette outfall)
Benjamin Chaires/Buck Lake/Chaires/Capitola Roads (St. Marks River)
Fairbanks Ferry Court (Ochlockonee River)
Flooded Property Acquisitions

Source: Leon County Public Works, 2009

Table 3.9. Leon County Future Capital Improvement Projects List, 2009.

Project
CAFWN Telemetry Expansion
St. Marks River Floodplain Acquisition
Campbell Pond Acquisition
Moccasin Gap Rd @ Sanders Hammock Pond
Miccosukee Rd: Black Creek and Patty Sink Drain
Crump Rd at Emerald Acres
Wadesboro Rd
Baum Rd: US 90, Black Creek, South of Pennewaw Trace
Bird Sink Floodplain Acquisition
Veterans Memorial @ US90
Jefferson Rd: Wadesboro Road and Patty Sink overflow
Patty Sink Floodplain Acquisition
Buck Lake Rd: Alford Arm and East of Baum
Copeland Sink Floodplain Acquisition

Source: Leon County Public Works, 2009

Chapter 4 – Plan Maintenance

4.1 Monitoring, Maintenance and Updating

The Steering Committee recognizes that in order to be effective, the *Tallahassee-Leon County Local Mitigation Strategy* must be reviewed and updated on a regular basis. To assist in this process, the LMS Committee has developed the following procedures:

1. The Steering Committee will meet annually to review the local mitigation strategy and ensure it is current and reflects changing conditions within the community. This should provide adequate time to incorporate any needed revisions prior to the next grant cycle. The Steering Committee will meet earlier or on a more frequent basis if needed, such as in a post-disaster environment.
2. The review of the local mitigation strategy will include:
 - a. Deletion of completed projects and/or programs;
 - b. Identification of new mitigation initiatives;
 - c. Evaluation of the impact of recommended changes to city and/or county plans and ordinances identified during the local mitigation process; and
 - d. Evaluation of any changes in the hazard identification and vulnerability assessment.
3. As needed, additional public and private sector interests will also be invited to participate in the review. Changes recommended by the Steering Committee will be forwarded to the Tallahassee-Leon County Planning Department and to Leon County Emergency Management for consideration. The Tallahassee-Leon County Planning Department, as coordinators for the LMS process, will forward recommended revisions to the City and County Commissions for final review and determination of action as directed by the Committee Chair.

Additionally, an annual Status Report will be prepared by the City of Tallahassee's Stormwater Management Division. This report will contain a report on the current status of each mitigation initiative, including progress towards the achievement of the initiatives purpose and new developments or programs impacting the implementation of the initiative.

LMS Committee meetings, annual review of the plan, continued public involvement and the annual Status Report provided by the City of Tallahassee Stormwater Management Division will all be integral in compiling a comprehensive update to the Local Mitigation Strategy in 2015. It is expected that the update process will take approximately one year to complete and will require LMS Committee members, local officials, and community members to actively participate in the update process by providing information and reevaluating LMS content.

4.2 Coordination with other Planning Mechanisms

The following section details past and future efforts to coordinate the LMS with other local planning mechanisms.

a. Tallahassee-Leon County Comprehensive Plan

The Comprehensive Plan serves as the planning document that guides development in both the City of Tallahassee and Leon County. In 2007, amendments to the Comprehensive Plan resulted in the addition of new policies and objectives based on mitigation initiatives contained in the LMS and recommendations of the LMS Committee. The Intergovernmental Coordination Element was amended to incorporate policies describing the role and function of the LMS Committee. The Conservation Element was amended to incorporate policies to increase wildfire mitigation efforts, a promoted through the LMS. Policies and objectives in the Land Use Element were amended to incorporate goals and actions prescribed in the LMS Prioritized Mitigation Initiatives List. Lastly, the Glossary was amended to add the terms ‘hazard’ and ‘hazard mitigation’ to the language and terms within the Comprehensive Plan. A full listing and description of policies and objectives incorporated into the Comprehensive Plan can be found in Technical Appendix J.

The LMS will continue to be integrated into the Comprehensive Plan in terms of policies governing land uses or infrastructure that may be at significant risk (e.g. through the Future Land Use or the Utilities Elements) and in terms of community priorities for investment, i.e., the Capital Improvements Element.

b. Leon County Comprehensive Emergency Management Plan

The LMS Committee and staff will continue to work with staff from the Leon County Sheriff’s Office to ensure policies, programs, mitigation plan and mitigation actions are consistent between the *Tallahassee-Leon County Local Mitigation Strategy* and the Leon County Comprehensive Emergency Management Plan

c. City of Tallahassee Stormwater Management Plan

The *Tallahassee-Leon County Local Mitigation Strategy* serves as the Stormwater Management Plan for the City of Tallahassee. The current LMS update will continue to serves as the City of Tallahassee Stormwater Management Plan and as part of the maintenance requirements for the Community Rating System (CRS), the City’s Stormwater Management Division will continue to produce an annual report on the status of the LMS and the list of prioritized mitigation initiatives.

d. City of Tallahassee Land Development Code

As discussed in Section 3.2, floodplain management regulations have been incorporated into the City of Tallahassee Land Development Code based on flood mitigation initiatives in the LMS and FEMA requirements. Mitigation initiatives included in the LMS will continue to be a consideration during the amendment of existing ordinances and regulations, and in drafting new ordinances and regulations for inclusion in the City of Tallahassee Land Development Code.

e. Leon County Land Development Code

As discussed in Section 3.2, floodplain management regulations have been incorporated into the Leon County Land Development Code based on flood mitigation initiatives in the LMS and FEMA requirements. Mitigation initiatives included in the LMS will continue to be a consideration during the amendment of existing ordinances and regulations, and in drafting new ordinances and regulations for inclusion in the Leon County Land Development Code.

f. City of Tallahassee Capital Improvement Projects

Previously, prioritized mitigation initiative #11 included current flood-related capital improvement projects as an important mitigation action for addressing flood-related hazards in the City of Tallahassee. In the 2010 LMS update, prioritized mitigation initiative # 9 includes continuing and newly identified flood-related capital improvement projects as an important mitigation action for addressing flood-related hazards in the City of Tallahassee. Capital improvement projects identified by the City of Tallahassee will continue to be incorporated into future updates to the LMS.

g. Leon County Capital Improvement Projects

Previously, prioritized mitigation initiative #11 included current flood-related capital improvement projects as an important mitigation action for addressing flood-related hazards in the Leon County. In the 2010 LMS update, prioritized mitigation initiative # 9 includes continuing and newly identified flood-related capital improvement projects as an important mitigation action for addressing flood-related hazards in the Leon County. Capital improvement projects identified by the Leon County will continue to be incorporated into future updates to the LMS.

4.3 Public Participation

The LMS Committee acknowledges that public participation is an important part of the plan maintenance and update processes for the local mitigation strategy. All LMS Committee meetings are publicly noticed by both the City of Tallahassee and Leon County Public Information offices. Implementation of the Strategy via capital projects or grant requests requires City or County commission approval (at minimum as part of the local government budgeting process, or more routinely as a separate action) and therefore is subject to public comment. Implementation of the Strategy via changes in public policy, such as through the local comprehensive plan or ordinance typically undergo several (noticed) public hearings before being considered for adoption. In sum, planning and implementation are subject to significant public review.

Separately from the publicly noticed annual meeting of the Steering Committee (which is required by the bylaws), at least one public meeting will be noticed and held annually to solicit further input on changes to the LMS or its planning procedures. This meeting may be held in conjunction with a commission workshop or with a scheduled agenda item regarding LMS activities before either the City or the County commission.

In addition to public notification for all LMS Committee meetings, making the 2010 LMS document available to the public online allows a broader proportion of the population the opportunity to participate in the LMS planning process. Citizens can contact TLCPD staff via an e-mail link on the webpage or by telephone through the number listed on the webpage with questions, concerns or comments.

To encourage public participation and increase community knowledge regarding the current LMS update and related planning processes, a copy of the 2010 LMS update will also be maintained on the Planning Department's webpage (www.talgov.com/planning/mitstrat/mitstra.cfm). A draft copy of the 2010 LMS update was added to the website prior to the public meeting on June 11, 2009 to give the community time to review the draft document and attend the meeting with questions and suggestions for revisions. The final draft will be posted online for at least 30 days prior to the adoption hearings provided by the City and County commissions in April 2010. After the 2010 update to the LMS has been approved and adopted by both the City and County Commissions, the adopted version will be added to the webpage.

Lastly, in an effort to keep the public updated on the status of mitigation initiatives promoted by the LMS, each year the annual Status Report compiled by the City of Tallahassee's Stormwater Management Division will be added to the Disaster Planning webpage. This report will contain a report on the current status of each mitigation initiative, including progress towards the achievement of the initiatives purpose and new developments or programs impacting the implementation of the initiative.