HURRICANE EVACUATION DECISION MAKING GUIDE

LEVY COUNTY

Prepared by the WITHLACOOCHEE REGIONAL PLANNING COUNCIL
July, 1984

HURRICANE EVACUATION

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INTRODUCTION

As part of the Withlacoochee Hurricane Evacuation Plan, decision-making guides are to be furnished to each county in the region and the Florida Bureau of Emergency Management for use as a ready reference tool by decision-makers during the approach of the storm. The purpose of the guide is to provide information to assist local and state civil defense officials and other emergency management organizations to implement the critical actions necessary to prepare for, and respond to, a hurricane threat.

Basically, the guides consist of two parts. The first part is largely an excerpt from the technical data report prepared for the coastal counties of the region. This excerpt provides information on the expected number of evacuees, needed sheltering and evacuation times according to the forecasted intensity of the hurricane.

The second part is concerned with the coordination of the evacuation. This includes information on the roles and responsibilities of agencies involved in the issuance of the evacuation order and the management of the evacuation. The chapter on local coordination is largely excerpted from the Hurricane Annex of the Local Peacetime Emergency Plans in each county. The chapter on regional coordination is excerpted from the technical data report.

In addition, the coordination section includes a discussion of the implications of the findings of the technical data report on local evacuation decision-making.

Also, a quick reference guide is included which presents information on the expected number of evacuees and recommended evacuation order times according to several evacuation scenarios.

CHAPTER I

QUICK REFERENCE GUIDE

The purpose of this chapter is to provide local decision-makers with a quick reference guide as to the number of persons vulnerable to hurricane hazards in Levy County and the recommended evacuation order times according to the forecasted intensity of the hurricane.

The population-at-risk and recommended evacuation order times are presented according to designated level of v ulnerability. These levels of vulnerability are based on the forecasted hurricane intensity.

It should be noted that the remaining chapters in this document should be read prior to consulting this quick reference guide in order to gain familiarity with how these numbers were calculated.

Vulnerability Level 'A'[1/]

Population-At-Risk

Surge-vulnerable residents: 4,714
Mobile-home residents: 7,363
Total: 12,077

Number requiring public shelter: 3,696

[1/] See Map 1 and table 2 for definition of vulnerability levels.

Recommended Evacuation Order Times[2/]

Storm Type	Storm Intensity[3/]	Evacuation Time
Exiting	1	11.5 Hours
Exiting	2	12.5
Paralleling	1	11.5
Paralleling	2	12.5
Paralleling	3	14
Paralleling	4	15
Normal	1	12.5
Normal	2	13

Vulnerability Level 'B'

Population-at-Risk

Surge-vulnerable residents: 7,493
Mobile-home residents: 6,426
Total: 13,919

Number requiring public shelter: 4,259

Recommended Evacuation Order Times

Storm Type	Storm Intensity	Evacuation Time
Normal	3	15 Hours
Normal	4	16
Normal	5	14

Vulnerability Level 'A' w/Tampa Bay

Population-At-Risk

If there is a concurrent Withlacoochee and Tampa Bay evacuation, population-at-risk figures increase as follows:

[2/] Chapter IV, Evacuation Times should be consulted for possible timing adjustments.

[3/] See table 1 and figure 1 for definition of storm types and intensities.

Total: 13,675

Number Requiring Public Shelter: 5,294

Recommended Evacuation Order Times

Evacuation times do not change significantly if there is a concurrent Tampa Bay and Withlacoochee evacuation.

Vulnerability Level 'B' w/Tampa Bay

Population-At-Risk

Total: 18,460

Number Requiring Public Shelter: 8,800

Recommended Evacuation Order Times

Evacuation times do not change significantly if there is a concurrent Tampa Bay and Withlacoochee evacuation.

Implications for Evacuation Decision-Making

Due to the long evacuation times required for certain intensities of hurricanes, readiness conditions may have to be accelerated (see Chapter VII, Local Coordinative Mechanism). In addition, the amount of resources required to accommodate the expected number of evacuees may have to be increased.

CHAPTER II

EXTENT OF EVACUATION

The extent of the hurricane evacuation refers to the identification of those persons vulnerable to hurricane hazards in Levy County and the calculation of this vulnerable population.

Identification of Vulnerable Population

There are primarily three hurricane hazards which necessitate or affect the evacuation of Levy County: hurricane force winds, storm surge and rainfall.

Hurricane Force Winds

Hurricane force winds are defined as 74 mph or greater. A computer program called SPLASH, developed by the National Hurricane Center, was used to predict peak wind speeds resulting from hurricanes. The results indicated that peak wind speeds may vary from 84-174 mph, depending on storm type and intensity. Figure 1 and table 1 display the types and intensities of hurricanes used in the SPLASH program and their resultant wind speeds.

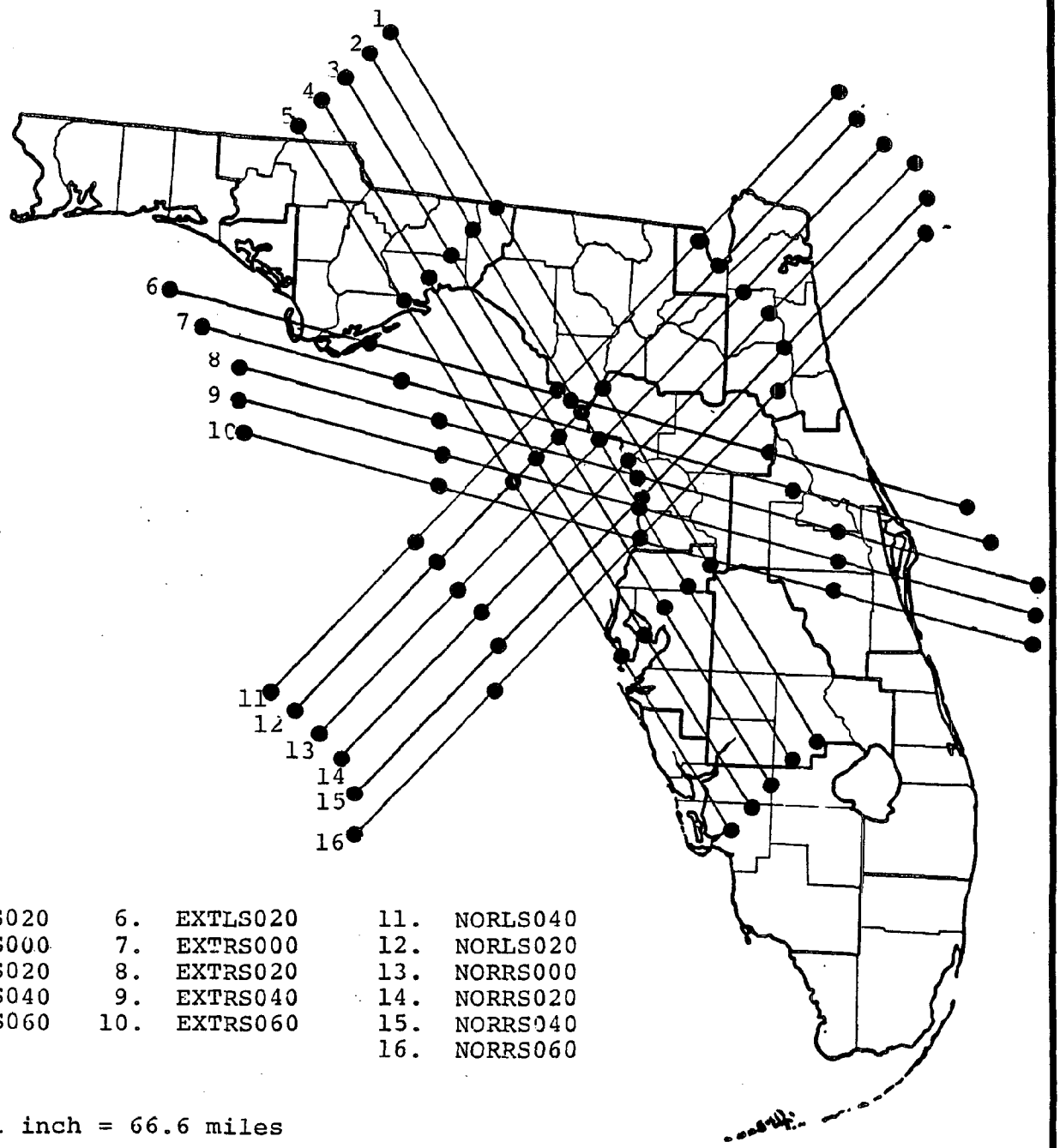
Mobile homes are particularly vulnerable to hurricane force winds because of their lightweight construction and flat sides and ends. Although local regulations require that mobile homes be anchored so as to withstand wind speeds in excess of 70 to 100 mph. In addition, mobile homes are more vulnerable to flying debris. As a result of this vulnerability to hurricane force winds, the National Weather Service recommends that all mobile home residents should evacuate in the event of a hurricane.

Storm Surge

The storm surge is the rising wall of ocean water, mainly produced by hurricane-force winds, which impacts upon coastal fringe areas. The storm surge is by far the most severe hurricane hazard. It causes 9 out of 10 hurricane-related deaths and possesses the greatest damage potential. A comparison of figure 1 with table 1 indicates that, of the hurricanes in the SPLASH model which produce the greatest affect on Levy County, peak surge heights are predicted to range from 4 to 33 feet, depending on storm type and intensity.

FIGURE 1

HYPOTHETICAL HURRICANE TRACKS*



1.	PARRS020	6.	EXTLS020	11.	NORLS040
2.	PARRS000	7.	EXTRS000	12.	NORLS020
3.	PARLS020	8.	EXTRS020	13.	NORRS000
4.	PARLS040	9.	EXTRS040	14.	NORRS020
5.	PARLS060	10.	EXTRS060	15.	NORRS040
				16.	NORRS060

Scale: 1 inch = 66.6 miles

*See table 1 for key to track identification.

TABLE 1

HURRICANES GENERATED BY SPLASH

Identification	Input Parameters: Pressure Drop (millibars)	Storm Speed (m.p.h.)	Radius Of Maximum Winds (miles)	Direction (degrees clockwise from North)	Results: Peak Surge Height (ft.)	Peak Wind Speed (m.p.h.)
NOR-01-LS040	30	15	20	45	9.6	86
NOR-01-LS020	30	15	20	45	11.6	86
NOR-01-RS000	30	15	20	45	11.6	86
NOR-01-RS020	30	15	20	45	9.8	86
NOR-01-RS040	30	15	20	45	8.7	86
NOR-01-RS060	30	15	20	45	7.4	86
NOR-02-LS040	40	15	20	45	13.0	99
NOR-02-LS020	40	15	20	45	15.6	99
NOR-02-RS000	40	15	20	45	16.0	99
NOR-02-RS020	40	15	20	45	12.9	99
NOR-02-RS040	40	15	20	45	11.8	99
NOR-02-RS060	40	15	20	45	10.0	99
NOR-03-LS040	60	15	20	45	19.6	121
NOR-03-LS020	60	15	20	45	23.6	121
NOR-03-RS000	60	15	20	45	24.2	121
NOR-03-RS020	60	15	20	45	20.2	121
NOR-03-RS040	60	15	20	45	17.9	121
NOR-03-RS060	60	15	20	45	15.2	121
NOR-04-LS040	80	15	20	45	26.4	140
NOR-04-LS020	80	15	20	45	31.8	140
NOR-04-RS000	80	15	20	45	32.6	140
NOR-04-RS020	80	15	20	45	27.2	141
NOR-04-RS040	80	15	20	45	24.2	140
NOR-04-RS060	80	15	20	45	20.5	140

TABLE 1 (cont.)

HURRICANES GENERATED BY SPLASH

	Input Parameters				Results	
Identification	Pressure Drop (millibars)	Storm Speed (m.p.h.)	Radius Of Maximum Winds (miles)	Direction (degrees clockwise from North)	Peak Surge Height (ft.)	Peak Wind Speed (m.p.h.)
NOR-05-LS040	100	15	12	45	24.8	174
NOR-05-LS020	100	15	12	45	26.0	172
NOR-05-RS000	100	15	12	45	33.1	172
NOR-05-RS020	100	15	12	45	29.2	174
NOR-05-RS040	100	15	12	45	23.6	174
NOR-05-RS060	100	15	12	45	21.4	174
PAR-01-LS060	30	15	20	120	8.2	86
PAR-01-LS040	30	15	20	120	8.3	86
PAR-01-LS020	30	15	20	120	8.0	86
PAR-01-RS000	30	15	20	120	7.3	82
PAR-01-RS020	30	15	20	120	5.2	73
PAR-02-LS060	40	15	20	120	11.1	99
PAR-02-LS040	40	15	20	120	11.2	100
PAR-02-LS020	40	15	20	120	11.0	99
PAR-02-RS000	40	15	20	120	10.1	95
PAR-02-RS020	40	15	20	120	7.3	86
PAR-03-LS060	60	15	20	120	16.8	122
PAR-03-LS040	60	15	20	120	17.1	122
PAR-03-LS020	60	15	20	120	15.7	122
PAR-03-RS000	60	15	20	120	15.8	118
PAR-03-RS020	60	15	20	120	11.5	108
PAR-04-LS060	80	15	20	120	22.6	141
EXT-01-LS015	30	15	20	165	5.2	84
EXT-01-RS000	30	15	20	165	5.7	84
EXT-01-RS015	30	15	20	165	4.0	86

TABLE 1 (cont.)

HURRICANES GENERATED BY SPLASH

	Input Parameters				Results	
Identification	Pressure Drop (millibars)	Storm Speed (m.p.h.)	Radius Of Maximum Winds (miles)	Direction (degrees clockwise from North)	Peak Surge Height (ft.)	Peak Wind Speed (m.p.h.)
EXT-01-RS030	30	15	20	165	3.9	86
EXT-01-RS045	30	15	20	165	3.6	86
EXT-02-LS015	40	15	20	165	7.4	99
EXT-02-RS000	40	15	20	165	8.0	98
EXT-02-RS015	40	15	20	165	5.7	99
EXT-02-RS030	40	15	20	165	5.5	99
EXT-02-RS045	40	15	20	165	5.1	99

Key for identification:

NOR - Path of hurricane normal or perpendicular to Gulf Coast
PAR - Path of hurricane parallel to Gulf Coast
EXT - Path of hurricane from point inland to Gulf Coast

01 to 05 - Hurricane intensity level based on Saffir/Simpson scale

LS, RS - Path of hurricane located to the left side or right side of Cedar Key, facing the Gulf Coast

000 to 060 - Distance of path of hurricane to the left or right from Cedar Key in miles

Source: SPLASH II computer output

Due to the severity of this hazard, all residents of areas subject to storm-surge flooding should evacuate. The approximate limits of the areas in Levy County subject to this hazard are shown in map 1.

Vulnerability Levels. Each storm type and intensity listed in table 1 which affects Levy County produces a different peak surge height. However, due to topographic changes in coastal areas, the extent to which the surge travels inland for several of these storm types and intensities does not change significantly. Therefore, these storm types and intensities are condensed into two vulnerability levels, as shown in table 2. The approximate geographic limits of these levels are shown in map 1.

Rainfall

Approximately 6 to 12 inches of rainfall can be expected to accompany a hurricane. However, the geographic distribution of this rainfall is difficult to predict prior to the arrival of the hurricane. Therefore, if heavy rains are predicted to accompany a hurricane, residents in areas subject to severe freshwater flooding should be prepared to evacuate in the event a hurricane warning is issued for their area.

Also, heavy rainfall can produce impedances in the evacuation process by causing difficult driving conditions. The effects of early rainfall on evacuation time are discussed in Chapter IV, Evacuation Times.

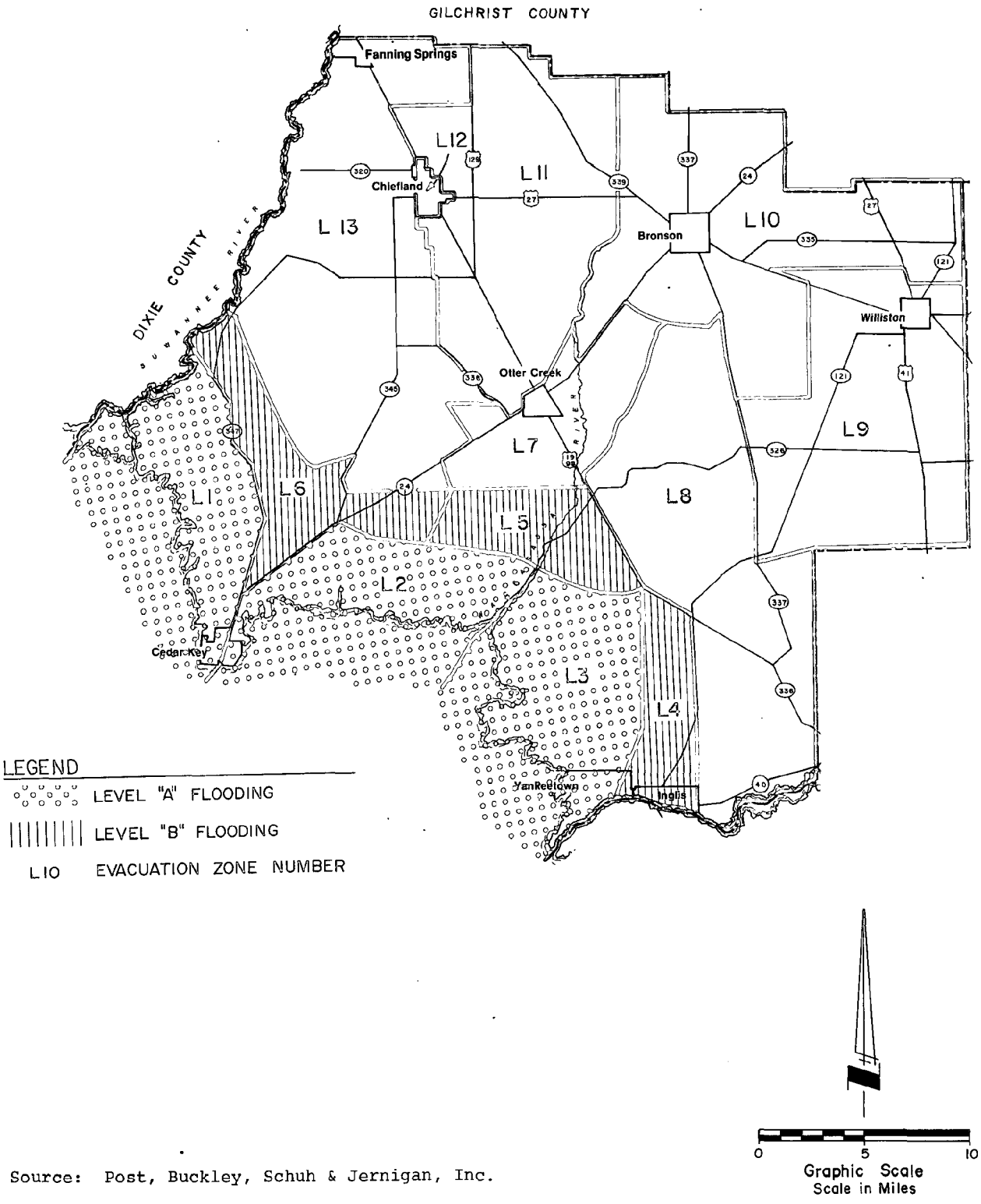
Population-At-Risk

The number of persons residing within the surge-vulnerable areas, as shown in map 1, and the number of mobile home residents outside these areas constitute the population-at-risk to hurricane hazards in Levy County.[1/] This is shown below by vulnerability level:

[1/] The number of persons evacuating due to freshwater flooding should be relatively minor.

MAP 1

EVACUATION ZONES - LEVY COUNTY



Source: Post, Buckley, Schuh & Jernigan, Inc.

TABLE 2

VULNERABILITY LEVELS

Storm Type	Storm Intensity[1/] Category	Vulnerability[2/] Level
Exiting	1	A
Exiting	2	A
Paralleling	1	A
Paralleling	2	A
Paralleling	3	A
Paralleling	4	A
Normal	1	A
Normal	2	A
Normal	3	B
Normal	4	B
Normal	5	B

[1/] Storm intensity category refers to the intensity level on the Saffir/Simpson scale.

[2/] Vulnerability levels are inclusive meaning that vulnerability Level B includes all persons residing within the areas bounded by Vulnerability Levels A and B (see Map 1).

Vulnerability Level	Population-At Risk
A	12,077
B	13,919

The difference between vulnerability levels 'A' and 'B' is the number of non-mobile home residents in surge area 'B', as shown in Map 1.

Evacuation Destination Distribution

As part of the technical data report for this plan, a statistically significant survey of hurricane response behavior was conducted in the Withlacoochee region.[2/] One of the questions asked in the survey was the evacuation destination. The destinations were public shelter, friend or relative and hotel/motel.

Based on the results of this survey and discussions with the Regional Disaster Preparedness Advisory Committee, the following evacuation destination distribution was developed for the coastal counties:

Evacuation Destination	Percentage of Population-At-Risk Seeking Destination
Public Shelter	30.6%
Friend or Relative	40.6
Hotel/Motel	28.8

It should be noted that, for the hotel/motel destination, there is not sufficient hotel/motel capacity to accommodate the expected number of evacuees seeking this destination. Therefore, those evacuees unable to obtain a hotel or motel in Levy County are assumed to seek such destinations outside the region.

Tampa Bay Evacuees

Based on a report prepared by the Florida Bureau of Emergency Management, approximately 30,000 evacuees from the Tampa Bay region are expected to enter the Withlacoochee Region via U.S. 41. Some evacuees will also enter the coastal counties via U.S. 301 and I-75. Of these evacuees, approximately 17,000 are expected to need public shelter.[3/]

[2/] Behavioral Surveys for the Withlacoochee Regional Disaster Preparedness Plan, H. W. Lochner, Inc., 1982.

[3/] Report on the Expected Coastal Demand for Inland County Shelter Facilities from the Tampa Bay and Southwest Florida Regions, Florida Bureau of Emergency Management, 1982.

The number of Tampa Bay evacuees entering Levy County will depend on available public shelter capacity in Levy County. According to the technical data report, if an evacuation order is issued for both the Tampa Bay and Withlacoochee regions, there is approximately 4,500 to 5,000 shelter spaces available for incoming Tampa Bay evacuees in Levy County, depending on the level of vulnerability. Assuming, that through traffic from the Tampa Bay region heads toward I-75 (which may require the use of traffic control personnel), this means that approximately 4,500 evacuees or approximately 1,700 vehicles may enter Levy County via U.S. 41 under a higher intensity storm.

Evacuation Routes and Zones

As part of a transportation model of a hurricane evacuation in the Withlacoochee region, the evacuation roadway network for each county was designated.[4/] This network is displayed in map 2 for Levy County.

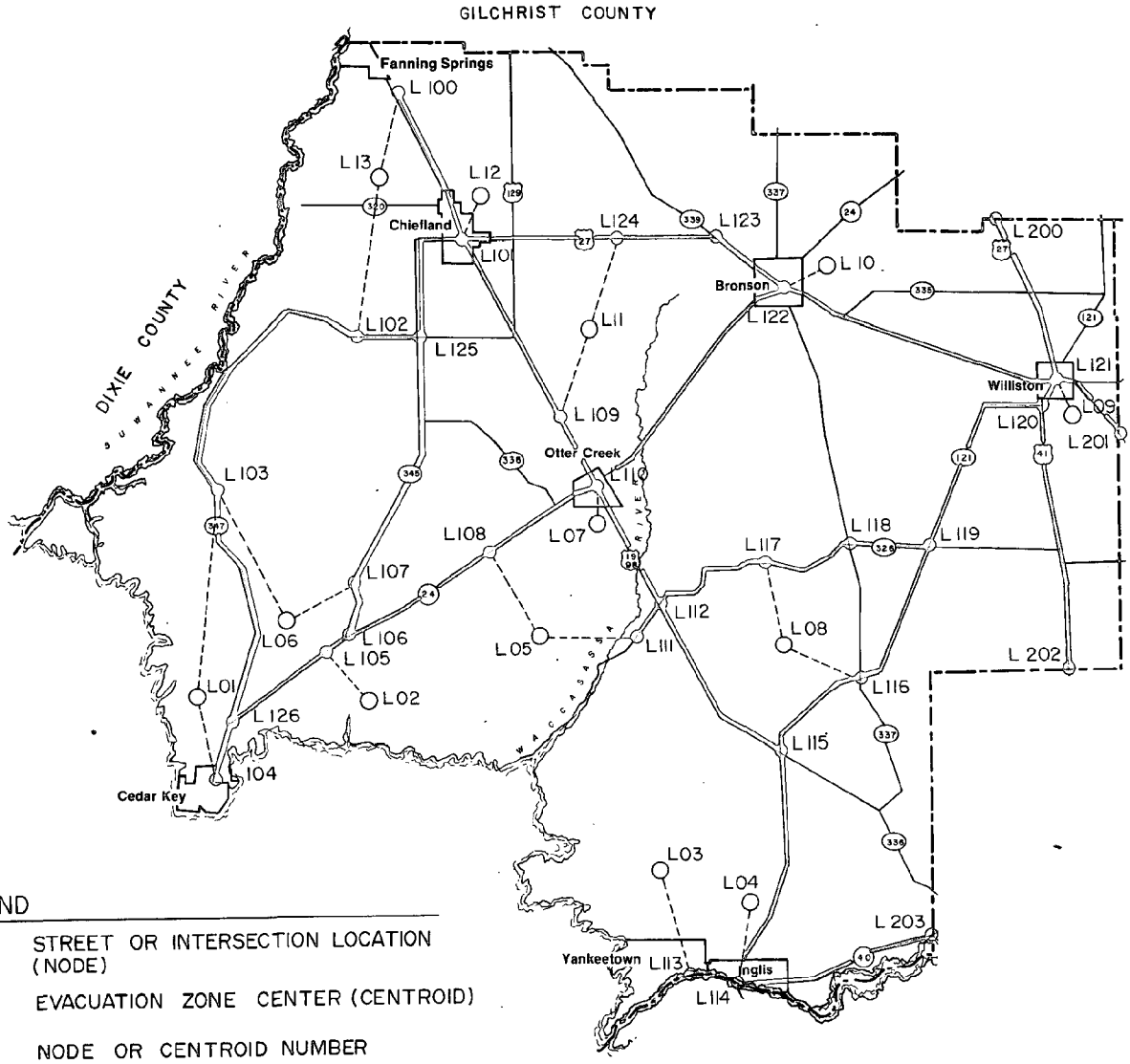
Another task of the transportation modeling effort was to divide the counties into evacuating zones. Zones were based on the roadway network and other easily identifiable boundaries.

These zones show the distribution of the population-at-risk within the county and thereby assists in the allocation of manpower and other resources within the county. Map 1 displays the evacuation zones developed for Levy County. Appendix A provides a written description of these zones. Tables 3 and 4 show the distribution of the evacuation population and number of vehicles, broken out by evacuation destination, for vulnerability levels 'A' and 'B', respectively.

[4/] Transportation Analysis: Withlacoochee Regional Hurricane Evacuation Plan, Post, Buckley, Schuh & Jernigan, August, 1983.

MAP 2

EVACUATION NETWORK - LEVY COUNTY



LEGEND

○ STREET OR INTERSECTION LOCATION (NODE)

○ EVACUATION ZONE CENTER (CENTROID)

L104 NODE OR CENTROID NUMBER

0 5 10

Graphic Scale
Scale in Miles

Source: Post, Buckley, Schuh & Jernigan, Inc.

TABLE 3

LEVY COUNTY EVACUATING POPULATION AT RISK AND EVACUATING VEHICLES

	Evacuating Population	1	2	3	4	Evacuating Vehicles	1	2	3	4
Zone #L01	2260					877				
		692	918	651	0		268	356	253	0
Zone #L02	113					44				
		35	46	33	0		13	18	13	0
Zone #L03	2341					909				
		716	950	674	0		278	369	262	0
Zone #L04	756					293				
		231	307	218	0		90	119	85	0
Zone #L05	54					21				
		17	22	16	0		6	9	6	0
Zone #L06	127					49				
		39	52	37	0		15	20	14	0
Zone #L07	124					48				
		38	50	36	0		15	20	14	0
Zone #L08	405					157				
		124	164	117	0		48	64	45	0
Zone #L09	1901					738				
		582	772	547	0		226	300	212	0
Zone #L10	1696					658				
		519	688	488	0		201	267	90	0
Zone #L11	429					167				
		131	174	124	0		51	68	48	0
Zone #L12	216					84				
		66	88	62	0		26	34	24	0
Zone #L13	1655					642				
		506	672	477	0		197	261	185	0
	12077	3696	4903	3480	0	4687	1434	1905	1351	0

1 = Red Cross Shelter
2 = Friends Home
3 = Hotel/Motel
4 = Do Not Know

% Participation	100
# per Mobile Home Unit	2.7
# per Other Unit	2.7
Avg. Veh. per D.U.	1.6
Veh. Usage %	65.5

Dist. %: S=30.6 FR=40.6 HM=28.8 DK=0

Surge Zones L01, L02, L03

TABLE 4

LEVY COUNTY EVACUATING POPULATION AT RISK AND EVACUATING VEHICLES

	Evacuating Population	1	2	3	4	Evacuating Vehicles	1	2	3	4
Zone #L01	2260					877				
		692	918	651	0		268	356	253	0
Zone #L02	113					44				
		35	46	33	0		13	18	13	0
Zone #L03	2341					909				
		716	950	674	0		278	369	262	0
Zone #L04	2371					920				
		725	962	683	0		282	374	265	0
Zone #L05	130					50				
		40	53	37	0		15	20	14	0
Zone #L06	278					108				
		85	113	80	0		33	44	31	0
Zone #L07	124					48				
		38	50	36	0		15	20	14	0
Zone #L08	405					157				
		124	164	117	0		48	64	45	0
Zone #L09	1901					738				
		582	772	547	0		226	300	212	0
Zone #L10	1696					658				
		519	688	488	0		201	267	190	0
Zone #L11	429					167				
		131	174	124	0		51	68	48	0
Zone #L12	216					84				
		66	88	62	0		26	34	24	0
Zone #L13	1655					642				
		506	672	477	0		197	261	185	0
	13919	4259	5650	4009	0	5402	1653	2195	1556	0

1 = Red Cross Shelter
2 = Friends Home
3 = Hotel/Motel
4 = Do Not Know

% Participation 100
# per Mobile Home Unit 2.7
# per Other Unit 2.7
Avg. Veh. per D.U. 1.6
Veh. Usage % 65.5
Dist. %: S=30.6 FR=40.6 HM=28.8 DK=0

Surge Zones L01, L02, L03, L04, L05, L06

CHAPTER III

PUBLIC SHELTER CAPACITY

Primary and Secondary Shelters

Primary shelters consist of the public schools in Levy County located outside of the surge-vulnerable areas. These shelters will be opened and used first in the evacuation process. Table 5 presents the capacity of the primary public shelters in Levy County.

Secondary shelters consist of churches and other civic buildings located outside of the surge-vulnerable areas. These shelters will only be opened if there is insufficient primary shelter capacity to accommodate the evacuees. Table 6 presents the capacity of the secondary public shelters in Levy County which were inventoried for the technical data report.[1/]

Table 7 displays the public shelter demand and capacities for each of the coastal counties. It can be seen that there is more than adequate primary shelter capacity to accommodate the expected number of Levy County evacuees. However, if an evacuation order is issued for both the Tampa Bay and Withlacoochee regions, all the primary and secondary shelter capacity in Levy County may have to be utilized. The implications of a Withlacoochee and Tampa Bay evacuation on evacuation times are discussed in the next chapter.

Shelter Duration Periods

The shelter duration period is defined as the minimum period of time in which evacuees must remain in their evacuation destination until the hurricane passes. This is defined as the period of time before and after the occurrence of gale force winds (39 - 73 mph). Gale force winds are assumed to create hazardous conditions due to flying debris. These times were calculated from the results of the SPLASH model and are displayed in table 8 for each hurricane type and intensity.

[1/]It should be noted that the list of secondary shelters was developed for the regional hurricane evacuation plan. Shelter agreements need to be established for the opening and operation of these shelters during a hurricane evacuation.

TABLE 5

LEVY COUNTY PRIMARY SHELTER CAPACITY

	Shelter Name	Address	Capacity[1/]
(L1)	Bronson Elementary School	School St. & Pine St. Bronson, FL 32621	477
(L2)	Bronson High School	School St. & Pine St. Bronson, FL 32621	360
(L3)	Joyce Bullock Elementary School	SW 3rd St. & SW 1st Ave., Williston, FL 32696	1,055
(L4)	Chiefland Elementary School	US 19 W & 8th Ave. Chiefland, FL 32626	1,270
(L5)	Chiefland High School	US 19 W & 8th Ave. Chiefland, FL 32626	1,095
(L6)	Williston High School	US 41 & SW 6th St. Williston, FL 32696	1,159
(L7)	Williston Intermediate School	C-511 & C331A Williston, FL 32696	385
(L8)	Yankeetown School	Port Ave. & Schoolcraft Dr., Inglis, FL 32649	212
	TOTAL		6,013

[1/]Based on 20 square feet of usable shelter space/person.

Source: Levy County School Board.

TABLE 6

LEVY COUNTY SECONDARY SHELTER CAPACITY

	Shelter Name	Address	Capacity
(L 9)	Methodist Church	235 Court Street Bronson	200
(L10)	First Baptist Church	Court St. & Capital St. Bronson	300
(L11)	Church of Jesus Christ	C.R. 418 & S.R. 345 Chiefland	196
(L12)	Ebenezer Baptist Church	C.R. 300 & C.R. 339 Chiefland	250
(L13)	First Baptist Church	U.S. 27 Alt. & N.E. 4th St. Chiefland	500
(L14)	First United Methodist Church	N.E. 1st St. & N.E. 7th Ave. Chiefland	50
(L15)	Church of Christ	C.R. 326 & U.S. 41 Morriston	125
(L16)	Church of God	S.E. 4th St. & S.E. 3rd Ave. Williston	150
(L17)	Faith Baptist Tabernacle	S.R. 500 & C.R. 335A Williston	228
(L18)	First Baptist Church	131 E. Noble Ave. Williston	800
(L19)	First United Methodist Church	W. Noble Ave. & S.W. 2nd Street Williston	200
	TOTAL		2,999

TABLE 7

NET SHELTER CAPACITY

Primary Shelter Capacity		Secondary Shelter Capacity		Shelter[1/] Demand		Net Shelter Capacity
		Levy County				
5,801	+	2,999	-	4,259	=	4,541
		Citrus County				
13,110	+	3,056	-	8,954	=	7,212
		Hernando County				
9,126	+	3,664	-	7,833	=	4,957
		Coastal County Total				
28,037	+	9,719	-	21,046	=	16,710
		Coastal County Total Plus Tampa Bay Evacuees				
28,037	+	9,719	-	37,839	=	-83

Sources: WRPC Staff analysis.

Report on Expected Coastal Demand for Inland County Shelter Facilities from the Tampa Bay and Southwest Florida Regions, Florida Bureau of Disaster Preparedness.

NOTES: [1/] Based on worst case surge vulnerability.

It should be noted that these are minimum shelter duration periods and that actual shelter duration periods may have to be increased depending on the results of the storm.

CHAPTER IV

EVACUATION TIMES

Evacuation times consist of three components: pre-landfall hazard time, behavioral response time and clearance time.

Pre-landfall hazard time is the number of hours before the eye of the storm strikes or makes its closest point of approach in which gale force winds occur. It is assumed that evacuation must be completed before the occurrence of gale force winds due to the potential of hazardous driving conditions. Pre-landfall hazard times are presented in table 8 for each storm type and intensity.

Behavioral response time is the amount of time it takes for the vulnerable population to respond to the evacuation order. These times were based on the survey of hurricane response behavior conducted in the Withlacoochee region and previous evacuation studies and were calculated as part of the transportation model.

Clearance time is the amount of travel time it takes for the vulnerable population to reach their evacuation destinations. This time was calculated as a part of the transportation model developed for the Withlacoochee region.[1/]

Evacuation time is the sum of these components. Tables 9 and 10 display the evacuation times by each level of vulnerability for each county in the Withlacoochee region. It can be seen that evacuation times are greatly increased in some counties, if both the Withlacoochee and Tampa Bay regions are issued an evacuation order.

[1/]Clearance time is calculated by determining which link in the evacuation roadway network, displayed in Map 2, is the most congested during the evacuation process. This is called the "critical link." The amount of time it takes for the last vehicle to "clear" this link is the clearance time. Appendix B presents the distribution of traffic on the roadway network in Levy County according to the evacuation scenarios developed for this report. The critical links are denoted with an asterisk.

TABLE 8

GALE FORCE WIND ANALYSIS AND SHELTER DURATION PERIOD
BY STORM TYPE AND INTENSITY

Storm Type	Storm Intensity	Pre-landfall Hazard Time	Shelter Duration Period
Normal	5	7.0[1/]	12.0[1/]
Normal	4	9.0	15.0
Normal	3	8.0	14.0
Normal	2	6.0	11.0
Normal	1	5.5	9.5
Paralleling	4	8.0	17.0
Paralleling	3	7.0	15.0
Paralleling	2	5.5	11.0
Paralleling	1	4.5	9.0
Exiting	2	5.5	13.0
Exiting	1	4.5	12.0

[1/] Pre-landfall hazard time and shelter duration period for storm intensity category five are shorter due to a narrower radius of maximum winds

Source: SPLASH II computer output.

TABLE 9

EVACUATION TIMES (in hours)

VULNERABILITY LEVEL 'A'

	Response Curve	REGIONAL VULNERABILITY LEVEL A	A w/Tampa Bay Evacuation
Levy County	A-Quick Response	8 3/4 - 12 1/4	8 3/4 - 12 1/4
	B-Medium Response	11 3/4 - 15 1/4	11 3/4 - 15 1/4
	C-Slow Response	14 3/4 - 18 1/4	14 3/4 - 18 1/4
Citrus County	A-Quick Response	12 1/4 - 15 3/4	12 1/4 - 15 3/4
	B-Medium Response	14 - 17 1/2	14 - 17 1/2
	C-Slow Response	16 - 19 1/2	16 - 19 1/2
Hernando County	A-Quick Response	8 3/4 - 12 1/4	29 1/2 - 33
	B-Medium Response	12 - 15 1/2	24 - 27 1/2
	C-Slow Response	15 - 18 1/2	30 3/4 - 34 1/4
Marion County	A-Quick Response	9 1/2 - 13 1/2	22 1/2 - 26
	B-Medium Response	12 1/2 - 16	24 - 27 1/2
	C-Slow Response	15 1/2 - 19	25 1/2 - 29
Sumter County	A-Quick Response	9 - 12 1/2	22 1/2 - 26
	B-Medium Response	11 3/4 - 15 1/4	24 - 27 1/2
	C-Slow Response	14 1/2 - 18 1/4	25 1/2 - 29

SOURCE: Post, Buckley, Schuh & Jernigan, Inc. and WRPC Staff.

TABLE 10

EVACUATION TIMES (in hours)

VULNERABILITY LEVEL 'B'

	Response Curve	REGIONAL VULNERABILITY LEVEL B	B w/Tampa Bay Evacuation
Levy County	A-Quick Response	10 3/4 - 14 3/4	10 3/4 - 14 3/4
	B-Medium Response	13 1/4 - 16 1/4	13 1/4 - 16 1/4
	C-Slow Response	16 1/4 - 19 1/4	16 1/4 - 19 1/4
Citrus County	A-Quick Response	16 1/4 - 18 1/4	16 1/4 - 18 1/4
	B-Medium Response	18 - 20	18 - 20
	C-Slow Response	20 - 22	20 - 22
Hernando County	A-Quick Response	15 1/4 - 18 1/4	32 - 34 1/2
	B-Medium Response	15 1/4 - 17 1/4	32 1/2 - 34 1/2
	C-Slow Response	17 1/2 - 19 1/2	33 1/4 - 35 1/4
Marion County	A-Quick Response	12 - 14	25 1/4 - 27 1/4
	B-Medium Response	15 - 17	25 3/4 - 28 3/4
	C-Slow Response	18 - 20	28 1/4 - 30 1/4
Sumter County	A-Quick Response	11 1/2 - 13 1/2	25 - 27
	B-Medium Response	14 1/4 - 16 1/4	26 1/2 - 28 1/2
	C-Slow Response	17 1/4 - 19 1/4	28 - 30

SOURCE: Post, Buckley, Schuh & Jernigan, Inc. and WRPC Staff

Timing Adjustments

Evacuation Order Adjustment. The behavioral response time includes response time before and after the evacuation order is issued. The amount of response time before the evacuation order is issued should be subtracted from the evacuation times listed in tables 9 and 10 in order to arrive at the minimum evacuation order time. These adjustments are as follows:

Behavioral Response	Change in Evacuation Time
A (quick)	subtract 1 hour
B (medium)	subtract 2 hours
C (slow)	subtract 3 hours

Early Arrival of Rainfall. The evacuation times set forth in this report include the number of hours before eye landfall (pre-landfall hazard time) when ambient high winds might prevent evacuation from being carried out. However, depending on the structure, size, or forward speed of the storm, hurricane-induced rainfall may precede this point in time. Historically, rainfall has occurred as late as two hours before eye landfall and as early as twenty hours before eye landfall. Such rainfall would reduce roadway carrying capacity because of limited driver visibility and wet pavement. This reduction has been estimated at approximately fifteen percent in past transportation studies. This adjustment requires a monitoring of the forecasted arrival of rainfall by the local weather service office radar. If the arrival of rainfall is forecasted substantially before the pre-landfall hazards time an amount of time equal to about fifteen percent of the clearance time should be immediately added to the evacuation time. The clearance time is the overall evacuation time minus the pre-landfall hazards time.

Based on the above, the following are the changes in evacuation time according to behavioral response:

Behavioral Response	Change in Evacuation Time
A	add 1.5 hours
B	add 1.5 hours
C	add 2 hours

Changes in Hurricane Parameters. Certain variables were used to predict wind speeds in the SPLASH model. If, according to the monitoring of the storm before landfall, these variables are different, the arrival of gale force winds could change and thereby affect pre-landfall hazard times.

The parameters in the SPLASH model which can affect the arrival of gale force winds and thereby pre-landfall hazard times are the forward speed of the storm and the radius to maximum winds. As the storm speed increases, there is less time required for the arrival of gale force winds, thereby reducing pre-landfall hazard time. As the radius-to-maximum winds increases, gale force winds arrive sooner, thereby increasing pre-landfall hazard times.

In order to ascertain the sensitivity of pre-landfall hazard times to the aforementioned, additional SPLASH program runs were made. Forward speed and radius-to-maximum winds were independently varied in each additional run. The results are presented and explained in table 11.

Unpredictable Road Blockages. The intensity of traffic during a hurricane evacuation will always be accompanied by a certain number of traffic accidents and breakdowns. Although roadway shoulders are available for vehicles in distress, the movement of such vehicles to these areas is often difficult and disruptive. It is recommended that at least two traffic control personnel be positioned at each key roadway link so that one can assist disabled vehicles as needed. A tow vehicle should also be positioned at each critical link to facilitate the removal of immobilized vehicles. Those roadways that historically experience flooding due to rainfall alone should be monitored for vehicle distress and help.

To guard against an unpredictable, and thus unquantifiable blockage of evacuation routes that could add to the overall evacuation time, a safety margin of up to two hours will be added to the evacuation times. Such unpredictable blockages could include: disabled vehicles, traffic accidents and fallen trees or other debris.

Recommended Evacuation Times. It is recommended that a medium behavioral response be used in determining the evacuation order time. It is also recommended that two hours be added to the evacuation time to account for unpredictable road blockages. Other adjustments in evacuation times should be made as necessary according to the previously mentioned adjustment factors.

TABLE 11

SENSITIVITY ANALYSIS OF PRE-LANDFALL HAZARD TIMES

Storm Speed

Intensity Level	Change in Storm Speed	Change in Hazard Time[1/]
1	+15 mph	-1.5 hrs.
2	+15	-2.0
3	+15	-4.0
4	+15	-4.0
5	+15	-3.0

Radius to Maximum Winds (RMW)

Change in RMW	Change in Hazard Time[2/]
-10	-2
+10	+2
+20	+4
+30	+6

[1/]Changes in pre-landfall hazard times for other changes in storm speed can be determined from this table. For example, if the storm speed is forecasted 10 mph greater than the storm speed used in the SPLASH model, which is 15 mph, the resultant change in storm speed is proportional. The hazard times will increase only if the forecasted storm speed is less than 15 mph.

[2/]Generally there is a 2 hour change in hazard time for every 10 mile change in RMW. The RMW used in the SPLASH model are shown in table 1.

SOURCE: SPLASH II computer printouts prepared by the National Hurricane Center.

Based on the above recommendations, the following are recommended evacuation order times according to level of vulnerability:

Vulnerability Level	Recommended Evacuation Time
A	11.5 to 15 hours[2/]
B	14 to 16 hours

These times represent minimum evacuation order times, excluding other adjustment factors. These times should be adjusted, using these factors, according to forecasted hurricane conditions.

Implications for Evacuation Decision-Making

As can be seen in tables 9 and 10, the evacuation times in Levy County do not change if there is a concurrent Tampa Bay evacuation, whereas, in some other counties in the Withlacoochee region, evacuation times are greatly increased.

There are two reasons why evacuation times do not change. First, Hernando and Citrus counties absorb some of the traffic from Tampa Bay on U.S. 41 before reaching Levy County. Second, and more importantly, it was assumed in the transportation model that through traffic (that is, traffic not seeking public shelter in Levy County) will gravitate toward I-75 and therefore not produce as much congestion on the roadways.

Even though the evacuation times are much longer in some other counties if there is a concurrent Tampa Bay evacuation, the evacuation times are still long enough in Levy County such that readiness conditions may have to be accelerated.

The effects of evacuation times on local preparedness activities are further discussed in Chapter VII, Local Coordinative Mechanism.

[2/] The difference in evacuation times for each vulnerability level are accounted by changes in storm intensity for each level. Recommended evacuation order times are presented by storm intensity in Chapter I, Quick Reference Guide.

CHAPTER V

WARNING INFORMATION

Warning information refers to the flow of information on the need for hurricane evacuation from the National Hurricane Center to the general public. The purpose of this chapter is not to propose a new method for the dissemination of warning information, but rather to explain the existing system.

Agency Participants and Warning Process

The following are the principal Federal, State and local governmental agencies involved in the warning system:

- National Hurricane Center, Miami
- Tampa Area Office, National Weather Service, Ruskin
- Florida Bureau of Emergency Management, Tallahassee
- Central Florida Area Office, Florida (Bureau of Emergency Management, Wildwood)
- Levy County Civil Defense Department
- Public Media (TV/Radio)

The warning process is initiated by the National Hurricane Center and reaches the public through the following five-step procedure:[1/]

1. A potential hurricane picked up in satellite images is usually the subject to the first in a series of advisory messages issued by the National Hurricane Center at six hour intervals (5 and 11 A.M. and P.M., Eastern Standard Time). These early advisories are aimed mainly at shipping and aviation interests. When the storm intensifies further into a tropical storm, it is given a name.

2. If the hurricane or tropical storm approaches land, the advisory information begins to focus on coastal and inland effects.

[1/]The following information was taken from the Pinellas County Hurricane Implementation Guide, prepared by the Tampa Bay Regional Planning Council, June, 1981.

- A Hurricane Watch announcement becomes part of the NHC advisories when the storm threatens coastal and inland areas. This Watch covers a specified area and period of time and means that hurricane conditions are a real possibility.

- A Hurricane Warning is added to the advisory when hurricane conditions, winds of at least 74 miles per hour, high water and storm tides, are expected within a period of up to 24 hours. The Warning identifies coastal areas where these conditions are expected to occur.

3. As the threat to coastal areas becomes more apparent, the advisories are then interspersed with intermediate advisories every three hours or as needed.

4. Once a hurricane becomes a threat to the Withlacoochee Region, then the Tampa Area office of the National Weather Service will add local statements to each NHC advisory and intermediate advisories. The local statements will consist of recommendations for precautionary actions and completion times, existing conditions of wind and tides, information regarding projected storm tides confronting counties of the region.

5. All normal warning information will be provided to the general public through the media (radio/TV) by the NHC and when necessary, local government.

The warning information provided by the hurricane advisories, intermediate advisories and local statements will be used as a basis to alert local officials and disaster organizations of any potential hurricane threat. These warnings are augmented by restricted information to local governments also furnished by the NHC to assist those governments in preparation and evacuation decision-making. This restricted information is normally received over the National Warning System (NAWAS) by the Department of Civil Defense, or, when activated, the Levy County Emergency Operations Center (EOC).

On the basis of the aforementioned warning procedure, the Governor of Florida is advised by the State Bureau of Disaster Preparedness to issue an evacuation order for the affected local area;[2/] or, the chief elected official of each affected local political jurisdiction may issue the evacuation order, as advised by its disaster preparedness agency or committee.

[2/] See appendix D for the chain of legal authority to issue an evacuation order.

The Central Florida Area Office will serve as the lead agency for coordinating an interregional evacuation, which is described in Chapter VI, Regional Coordinative Mechanism.

Local disaster preparedness agencies and other agencies, such as fire districts, Red Cross and Sheriffs Departments will be the key agencies in carrying out the evacuation. Agency involvement and specific evacuation procedures are discussed in Chapter VII, Local Coordinative Mechanism.

The following is a chronological summary of key warning conditions, based on the above information, in relation to the number of hours before projected hurricane eye landfall or closest point of approach:

- 72 hour advisory: storm assigned Category number on Saffir/Simpson Scale by NHC
- 48 hours before projected eye landfall: local areas placed under hurricane watch condition by NHC
- 24 hours before projected eye landfall: local areas placed under hurricane warning condition by NHC
- 12-24 hours before projected eye landfall: local area advised to evacuate by NHC advisory or local NWS office Local Action Statement
- Governor advised by Bureau of Emergency Management to issue an evacuation order for the local area or Executive Group, Hurricane Evacuation Committee advised by its control group to issue an evacuation order for the jurisdiction. The local evacuation order should be issued according to the recommended evacuation order times in this guide.

CHAPTER VI

REGIONAL COORDINATIVE MECHANISM

Regional Evacuation Scenarios

For purpose of this report, "regional" is defined as affecting more than one county. Accepting this definition, the hurricane is definitely a regional event. This is not only because its hazards can affect a relatively large area, but also due to the error in prediction as to where the hurricane will strike, or make its closest point of approach (CPA) during the hurricane warning period, typically 12 to 24 hours before CPA. It is possible that up to a 250-mile "warning area" along the coast may occur during the warning period due to this error in prediction. Therefore, it is possible that, for example, both the Withlacoochee and the Tampa Bay regions may fall under this "warning area" and, hence, have to be evacuated.

It should be further noted that the rate of reduction of hurricane-force winds after the hurricane makes its closest point of approach is largely unpredictable. Therefore, it is assumed that the mobile-home residents in the inland counties will have to evacuate regardless of the type or intensity of the hypothetical hurricane tracks modeled in the SPLASH computer model, should an evacuation order be issued for the inland counties.

Based upon the above information, three regional evacuation scenarios have been designated for purposes of this report. They are as follows:

- Regional Scenario A: includes all of the residents within the evacuation zones associated with Vulnerability Level 'A' in the coastal counties, the mobile-home residents in the remainder of the coastal counties and the mobile-home residents in the inland counties.

- Regional Scenario B: includes all of the residents within the evacuation zones associated with Vulnerability Levels A and B, the remainder of the coastal mobile-home residents and inland mobile-home residents.

- Regional Scenario C: includes all of the residents in Regional Scenario B and the number of persons entering the Withlacoochee region from the Tampa Bay region, based on the worst-case regional evacuation scenario for the Tampa Bay region.

The aforementioned scenarios do not cover all the possibilities in that it is possible that, for example, only the northern counties of Levy and Marion need be evacuated should the "warning area" be further to the north. The same applies to the southern counties of Citrus, Sumter and Hernando; should it be further to the south. It is also possible that, for example, the Tampa Bay region may be evacuated without any of the counties in the Withlacoochee region evacuated. Thus, the regional scenarios should be viewed as worst-case planning possibilities, based on currently available information.

The population-at-risk for each regional scenario is shown below:

Regional Scenario	Population-At-Risk
A	98,742
B	112,232
C	255,742

Implications for Evacuation Decision-Making

The implications of the regional evacuation scenarios for evacuation decision-making in Citrus County are primarily in regard to the possible need for additional manpower and other resources necessary to accommodate Tampa Bay evacuees.[1/] Since the public shelter capacity in most of the other counties appears to be sufficient, there should be no evacuees from other counties in the Withlacoochee region entering Citrus County.

In terms of evacuation times, there appears to be a negligible increase in time if there is a concurrent Withlacoochee and Tampa Bay evacuation. However, additional traffic manpower may be necessary to divert through traffic from U.S. 41 to I-75.

[1/]The procedures for obtaining any needed additional resources for the evacuation is addressed in the next section and in Chapter VII, Local Coordinative Mechanism.

Regional Coordination

Lead Agency

To effectively coordinate a regional response to a hurricane emergency, a lead agency must be designated to provide a linkage among the organizational participants. The lead agency must have jurisdiction over a multi-county area, and process sufficient expertise, staff and funding to effectively manage the evacuation. A reliable communication system is also crucial for the overall coordination of the evacuation.

It is proposed that the Central Florida Area Office for the Bureau of Disaster Preparedness (CEFA) located in Wildwood, be designated as the lead agency for interregional evacuation management. While other entities were considered for designation as lead agency, CEFA appears to be best qualified for terms of the criteria mentioned above. (See Figure 2.)

As the lead agency with overall responsibilities for coordination in the Withlacoochee Region, CEFA will serve as the focal point for the flow of information on hurricane warnings, evacuations and shelter openings.

Regional Entities

Organizations that will be involved at the regional level include the Florida Highway Patrol, the Red Cross and the Health and Rehabilitative Services Department. The FHP maintains traffic control and maintains the progress of the evacuation. Continuous communication with the regional EOC will provide up-to-the-minute information on the evacuation and thereby improved decision-making during the emergency. The Red Cross will be involved at the regional level in the opening and staffing of shelters. The regional office of the Red Cross would assist in areas without a local Red Cross Chapter. The State Department of HRS provides manpower assistance to the Red Cross should insufficient personnel be available for staffing of hurricane shelters.

Procedures for Implementation of Interregional Evacuation Plan

To be effective, the plan for interregional evacuation must contain a coordinative mechanism to establish procedures for the opening of shelters and reception sites in coordination with evacuation movements. The proposed procedures for implementation of the interregional plan are described below for each phase of the hurricane emergency.

Normal Conditions

Representatives of the participating agencies involved in the plan will meet on a regular basis to enhance ongoing coordination among the agencies and identify problems with the implementation of the plan.

This group should meet as a permanent committee, and focus on the regional aspects of hurricane planning and operations. Activities of the committee may include:

- testing of the plan
- review of the institutional arrangements for coordination
- improvement of public awareness of hurricane hazards
- exchange information on ways to improve disaster response and recovery.

Emergency Conditions

As a hurricane develops and threatens land areas, the National Hurricane Center will issue a hurricane watch twenty four to forty-eight hours before landfall. This alerts threatened areas to potential storm conditions. A hurricane warning should be issued according to the recommended evacuation order times in this report. These warnings are issued to the State Bureau of Emergency Management as well as county civil defense offices.

Post Emergency Conditions

As the hurricane hazard recedes from the region, the Area Coordinator should continue to act as the liaison between coastal and inland counties. Information on when it is safe to return to effected areas can be transmitted to the inland county civil defense offices. The Area Office should also assist where ever possible in an expedient and effective disaster recovery process.

After recovery has been completed, the interregional committee should meet to evaluate the plan as implemented and identify any problems that may have occurred.

Public Notification

During non-emergency periods, public information and education is disseminated by various agencies through news releases, news features, and radio and television programs. Such activity serves to increase awareness of emergency preparedness programs and provides the citizens with a knowledge of the basic precautions necessary during an emergency.

During emergency periods, it is necessary to provide the public with clear, concise, and timely information and instructions to the general public. It is important that one single agency in each jurisdiction be designated as the sources of public information in an emergency. This will avoid the issuance of conflicting reports and provide a continuous flow of information regarding governmental decisions, recommendations and instructions. Public notification and instructions will be issued by the civil preparedness agency within each respective jurisdiction. This information should be disseminated after consultation and coordination with the Central Florida Area Office, Bureau of Emergency Management.

While primary responsibility for public notification is conferred to the respective civil preparedness agencies, it is suggested that the procedures below be incorporated into the public notification process to improve interregional coordination. These suggestions are divided into three phases: normal, emergency, and post emergency conditions.

Normal

Public information materials developed as part of the Regional Hurricane Evacuation Plan (and prepared by the Regional Planning Council) should be disseminated to coastal and inland residents. This material will educate the public on hurricane hazards, and provide instructions based on the findings of the inland shelter study. The material will identify the sources of further information and assistance during the emergency phase.

Emergency

It is suggested that as the emergency approaches, an emergency public information officer be activated to act as the only official sources of public information for that jurisdiction. This officer should be pre-designated and in constant communication with the National Hurricane Center, surrounding EOC's and CEFA.

Evacuation and sheltering instructions on cassette tapes or radio scripts which have been prepared beforehand can be dissminated at this time. In the print media, area newspapers could print hurricane supplements which have been prepared in cooperation with the civil preparedness agency.

Post Emergency

In this phase the public information officer should continue to be the official source of public information and should receive information from various service agencies for dissemination to the public. The officer should assist State and Federal officers in local dissemination of information concerning their programs.

Personnel for Reception Centers and Shelters

Assignment and notification of personnel to emergency facilities is the responsibility of the county civil defense director. The mobilization of emergency personnel will follow the issuance of an evacuation order. Through consultation with CEFA, the civil defense director should have a good idea of the timing and scope of the evacuation in coastal areas. He may then mobilize county resources to the required level.

To ensure that shelters and reception centers are properly staffed in an emergency, it is suggested that procedures be established for assignment and notification of personnel. These procedures should be developed as part of a plan of action that is consistent with the regional plan and relevant to the needs and resources of the county.

Suggested Plan of Action

Key members of county government, the Red Cross and other agencies should meet with the civil defense director as a group to establish the roles and responsibilities of the participants. A plan of action can be devised to acquaint each member with the duties that his organization is expected to perform.

The group or committee is put on call with the issuance of the hurricane watch. Key members of the committee (those in charge of a county division for example) would meet with the civil defense officer to review plans, and determine readiness of equipment, supplies and personnel.

Several hours prior to the recommended evacuation order times, the key personnel would activate their departmental or agency emergency plans, and alert and maintain communications with personnel. As evacuation are announced, the committee would monitor the situation and respond to instructions from the civil defense officer.

Prior to the recommended evacuation order times, the EOC should be fully operational with each participant performing assigned duties and tasks. Emergency operations would be in full swing and involve several different areas:

- communication with the Red Cross for shelter openings
- broadcast of hurricane precautions
- communications with public utilities
- law enforcement: patrols, road blocks, rescues
- coordination of emergency services and needs

With the onslaught of the hurricane, activities in the affected areas are halted. The progress of the storm and emergency operations are monitored at the EOC.

After the danger has passed, post disaster operations will be initiated. A written report and evaluation should be provided to the civil defense officer.

CHAPTER VII

LOCAL COORDINATIVE MECHANISM

Plan of Action

The Levy County Civil Defense Department has not yet developed the hurricane evacuation element of its Local Peacetime Emergency Plan.

It is suggested that the plan of action presented in Chapter VI, Regional Coordinative Mechanism can be used as a general framework for a local plan of action until the Levy County hurricane evacuation element is developed.

Traffic Control Points

Traffic control points are points along the county evacuation network used to direct traffic, resolve congestion problems and to divert traffic to other shelter destinations when the capacity of public shelters is reached.

It is recommended that the "nodes" indicated on Map 2 be used as a basis for designating traffic control points in the county. In addition, Appendix B shows the projected amount of traffic on each of the links in the evacuation network during the evacuation. This information can also be used to determine traffic control points.

Shelter Assignments

Shelter assignments refer to the assignment of vulnerable persons within each evacuation zone to a particular shelter destination in the same or another evacuation zone. The assignment of individuals to public shelter destinations is based on the results of the transportation model.

The assignment of vulnerable residents requiring public shelter to public shelter destinations follow a three-phased procedure: designation of reception centers, assignment of intra-county evacuees and assignment of intercounty evacuees.

Designation of Reception Centers. In order to prevent the unnecessary opening of public shelters and thereby conserve needed evacuation manpower, evacuees will be first assigned to a reception center. A reception center is a key

primary public shelter which will serve as a control point for opening additional public shelters. One reception center will be opened in each evacuation zone which contains at least one primary public shelter. During the evacuation process, as it becomes apparent that the capacity of the reception center will be exceeded, other primary public shelters in the evacuation zone or surrounding evacuation zones can be opened through a communications network.

The criteria for the designation of reception centers are those primary shelters in each evacuation zone which have the greatest shelter capacity and are the most feasible for use as public shelter. Reception centers and associated primary public shelters for Levy County are presented in table 12.

Intra-County Assignment. The goal of the intra-county shelter assignment is to minimize clearance time. As part of the transportation model, vulnerable intra-county residents were assigned to primary public shelter locations in each county.[2/]

The logic of this shelter assignment can be seen by comparing table 13 with map 2. Table 13 shows the "paths" by which the vulnerable residents of an evacuation zone proceed to their primary shelter destinations. This is represented conceptually on map 2 with evacuation zone centers, or centroids, and street or intersection locations, or nodes.

By following these paths, it can be seen that the vulnerable residents of each evacuation zone are assigned to the nearest primary shelter location until all the available primary shelters in the destination evacuation zone are utilized. If there is any overflow, the remaining evacuees are assigned to the nearest available primary public shelter.

Inter-County Assignment. In the case of both the Withlacoochee and Tampa Bay regions evacuating (Regional Scenario C), it is assumed that a certain percentage of the Tampa Bay evacuees will enter the coastal counties via U.S. 41.

Under this scenario, the first reception center nearest U.S. 41 in each coastal county shall be designated as an inter-regional control center. These centers will monitor the number of incoming intra- and inter-regional evacuees and disseminate them, first among available primary shelter capacity and then to secondary shelters, if primary shelter capacity is exceeded.

[2/] It was assumed in the assignment of intra-county evacuees that primary public shelters would be opened first. Since there is adequate primary shelter capacity for coastal county evacuees, no secondary shelters were used in the assignment.

TABLE 12

RECEPTION CENTERS AND ASSOCIATED PRIMARY SHELTERS

Levy County

Evacuation Zone	Reception Center[1/]		Associated Primary Shelters	
L4	(L8)	Yankeetown School		None
L9	*(L7)	Williston High School	(L3)	Joyce Bullock Elementary School
			(L7)	Williston Intermediate School
L10	(L1, L2)	Bronson High and Elementary Schools		None
L12	(L4)	Chiefland Elementary School	(L5)	Chiefland High School

[1/]Asterisk indicates inter-regional reception center.

TABLE 13

LEVY COUNTY EVACUATION ROUTES
TO PUBLIC SHELTER

L01-L104, L126, L105, L106, L107, L125, L101-L12 or L01-L103, L102, L125, L101-L12

L02-L105, L106, L108, L110, L122-L10

L03-L113, L114, L115, L116, L119, L120, L121-L09

L04-L04 (Flood Level A); L04-L114, L115, L116, L119, L120, L121-L09 (Flood Level B)

L05-L108, L110, L122-L10 or L05-L111, L112, L110, L122-L10

L06-L107, L125, L101-L12 or L06-L103, L102, L125, L101-L12

L07, L110, L122-L10

L08-L116, L119, L120, L121-L09 or L08-L117, L118, L119, L120, L121-L09

L09-L09

L10-L10

L11-L109, L101-L12 or L11-L124, L101-L12

L12-L12

L13-L102, L125, L101-L12 or L 3-L100, L101-L12

Source: Post, Buckley, Schuh & Jernigan, Inc.

APPENDIX

APPENDIX A

LEVY COUNTY
EVACUATION ZONE BOUNDARIES

Evacuation Zone	Zone Boundary Description
L1	South of Suwannee River; west of CR 347 and SR 24; all of Cedar Key; north and east of Gulf of Mexico
L2	South of SR 24 and Main Line Road; west of Waccasassa River; north of Gulf of Mexico; east of SR 24
L3	South of Wacassassa River and Robinson Road; west of two miles west of US 19; north of Levy County line; east of Gulf of Mexico
L4	South of CR 336; west of US 19; all of Inglis; north of Levy county line; east of two miles west of US 19
L5	South of two miles north of Main Line Road; west of US 19; north of Robinson Road and Main Line Road; east of Rocky Run
L6	South of Suwannee River, two miles northeast of CR 347 and Purdue Road; west of Rocky Run; north of Main Line Road and SR 24; east of CR 347
L7	South of SR 24 and Yearty Road; west of 01 Road #4 and #7; north of two miles north of Main Line Road; east of Rocky Run
L8	South of Osteen Road; west of CR 337 and Levy County line; north of Levy County line; east of US 19, 01 Road #4 and #7.
L9	South of CR 343; west of Levy County line; north of Levy County line; east of CR 337 and Williston Highlands area Road
L10	South of Levy County line; west of Levy County line; north of CR 343 and Osteen Road; east of Waccasassa River
L11	South of Levy County line; west of Waccasassa River; north of Otter Creek; east of CR 336, CR 330, Chiefland, railroad and SR 49
L12	Chiefland city limits
L13	South of Suwannee River and Levy County line; west of SR 49, railroad, Chiefland, CR 330 and CR 336; north of two miles north of Main Line Road, Purdue Road and Moody Road; east of two miles east of CR 347

APPENDIX B

Levy County
Assigned Link Volumes and V/C Ratios

Link	TOTAL LINK VOLUME A	A w/tb	B	B w/tb	Service Volume	VOLUME/CAPACITY RATIO A	A w/tb	B	B w/tb
100-101	260	260	297	297	32400	.008	.008	.009	.009
101-125	658	658	665	665	14600	.045	.045	.046	.046
102-125	634	634	233	233	10100	.063	.063	.023	.023
102-103	475	475	92	92	10100	.047	.047	.009	.009
103-126	455	455	0	0	10100	.045	.045	.000	.000
104-126	870	870	804	804	14600	.060	.060	.055	.055
105-126	415	415	804	804	14600	.028	.028	.055	.055
105-106	449	449	838	838	14600	.031	.031	.057	.057
106-107	51	51	20	20	14600	.003	.003	.001	.001
107-125	24	24	431	431	14600	.002	.002	.030	.030
106-108	430	430	495	495	14600	.029	.029	.034	.034
108-110	440	440	527	527	14600	.030	.030	.036	.036
101-109	140	140	164	164	25900	.005	.005	.006	.006
109-110	77	77	155	155	25900	.003	.003	.006	.006
110-112	83	83	166	166	25900	.003	.003	.006	.006
111-112	0	0	0	0	10100	.000	.000	.000	.000
112-115	83	83	173	173	25900	.003	.003	.007	.007
114-115	976	976	1833	1833	25900	.038	.038	.071	.071
113-114	914	914	916	916	11300	.081	.081	.081	.081
115-116	892	892	1664	1664	14600	.061	.061	.114	.114
112-117	0	0	0	0	10100	.000	.000	.000	.000
117-118	71	71	26	26	10100	.009	.009	.003	.003
116-119	964	964	1742	1742	14600	.066	.066	.119	.119
119-120	1035	1035	1768	1768	14600	.071	.071	.121	.121
118-119	71	71	26	26	10100	.007	.007	.003	.003
120-121	1035	1035	1768	1768	11300	.092	.092	.156	.156
121-122	769	769	812	812	14200	.054	.054	.057	.057
110-122	485	485	579	579	14600	.033	.033	.040	.040
122-123	152	152	152	152	14200	.011	.011	.011	.011
123-124	152	152	152	152	14600	.010	.010	.010	.010
101-124	216	216	213	213	14200	.015	.015	.015	.015
200-121	654	654	772	772	14600	.045	.045	.053	.053
201-121	653	653	772	772	14600	.045	.045	.053	.053
202-120	0	0	0	0	14600	.000	.000	.000	.000
203-115	0	0	0	0	14600	.000	.000	.000	.000
203-114	0	0	0	0	14200	.000	.000	.000	.000

APPENDIX C

LEGAL AUTHORITY TO ISSUE AN EVACUATION ORDER

In any hurricane evacuation, one of the most critical components of the decision-making process for local government officials is the timely issuance of the evacuation order to the endangered population. Within the State of Florida, the decision-making authority and power to order evacuation has been conferred or delegated to three different levels of government: state, county and municipal. Such emergency powers at the various levels of government are also innate responsibilities of the particular jurisdictions to safeguard the lives and property of their citizens. The Governor is empowered to issue an evacuation order; however, in the event that the Governor fails to order evacuation as early as required by local conditions, then the Board of County Commissioners may order evacuation within its physical boundaries. The same is true for a mayor of any municipality in the region. However, the evacuation order of a higher level of government is binding upon a lower level of government.

The authority to order evacuation of threatened Florida residents from an approaching hurricane is conferred to the Governor by Chapter 252.36 (5)(c) of the Florida Statutes, stating that the Governor may:

> "...direct and compel the evacuation of all or part of the population from any stricken or threatened area within the State if he deems this action necessary for the preservation of life or other disaster mitigation, response or recovery."

This power to order evacuation from an approaching hurricane conferred upon the Governor by Statutes is delegated to the governing body of each political subdivision of the State by Executive Order 80-29. The term "political subdivision" is defined under the Statute as "any County or municipality created pursuant to law." The delegation of authority empowers the chief elected official of a county or municipality to order an evacuation from any approaching storm.

The diffusion of the authority to issue an evacuation order does not create problems during a localized evacuation. However, in the case of a hurricane which threatens the coastal residents of the Withlacoochee or Tampa Bay Regions, it, by necessity, demands detailed inter-jurisdictional coordination. This is especially true in the event of the evacuation of the highly population Tampa Bay Region with its many municipal and county jurisdictions all with the power to issue an evacuation order. An evacuation order not

coordinated between municipal, and county officials can have a devastating impact upon the evacuation jurisdiction as well as surrounding jurisdictions. Prior to the evacuation order, region-wide traffic control and coordinated opening of the shelters should be established. Since a portion of the Tampa Bay evacuees will seek shelter in the Withlacoochee Region, a mechanism of coordination is needed to alert officials in the probable "host" counties of the impending evacuation. A proposed mechanism to achieve this coordination is described in Chapter VI, Regional Coordinative Mechanism.

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