2.24 Hurricane Evacuation – Maintenance of Clearance Times and Adequate Shelter Space

A. Introduction and Background

Hurricane preparedness and continued growth in the coastal areas are not only major regional issues but local issues as well. Based on the Census 2000 population count, 34,080 people reside within the designated Coastal High Hazard Area of Collier County, FL. This has been an ongoing, major concern with the residents of this County, which will be addressed through this EAR-based process.

B. Identification of Specific Objectives from the following Elements: Conservation and Coastal Management, Transportation, and Future Land Use

Objective	Target	Conditions when Plan was adopted	Current Conditions	Comments
Objective 1, Future Land Use Element, Through the magnitude, location and configuration of its components, the Future Land Use Map is designed to coordinate land use with the natural environment including topography, soil and other resources; promote a sound economy; coordinate coastal population densities with the Regional Hurricane Evacuation Plan; and discourage unacceptable levels of urban sprawl.	Appropriately designate lands for various land use intensities and densities	The Future Land Use Map (FLUM) illustrated a variety of land use designations	FLUM illustrates a variety of land use designations	Through this objective's underlying policies, the FLUM assigns densities and intensities of land use based on a number of variables including the Regional Hurricane Evacuation Plan. This objective should stay in the plan

Objective	Target	Conditions when Plan was adopted	Current Conditions	Comments
I. Urban Designation, A. Urban – Mixed Use District, 2. Urban Coastal Fringe Subdistrict, *Future Land Use Element*: The purpose of this Subdistrict is to provide transitional densities between the Conservation Designated Area and the Urban designated Area. In order to facilitate hurricane evacuation residential densities shall be limited to a maximum of 4 dwelling units per acre, except as allowed in the revised Density Rating System to exceed 4 units per acre through provision of Affordable Housing and Transfer of Development Rights, and except as provided in the Bayshore/Gateway Triangle Redevelopment Overlay.	Limit future platting/density in the Coastal High Hazard Area (Tropical Storm and Category 1 flood zones)	The Coastal High Hazard Area (CHHA) contained platted property.	The CHHA continues to contain platted property. However, all plats subsequent to the effective date of this objective have been limited to only 4-units/per acre.	This is a good objective, which should remain in the Future Land Use Element. Contingent upon the event of a tropical storm/hurricane event that causes considerable loss in life and property, the County should reevaluate the Density Rating system in light of the Bert J. Harris Act.

Objective	Target	Conditions when Plan was adopted	Current Conditions	Comments
A. Future System Needs, *Transportation Element*, select projects to be funded under the Capital Improvement Plan on criteria so that priorities are funded.	Priority-based capital improvements planning	The Capital Improvements Plan did not always track the Comprehensive Plan and there were no clear priority in the Comp. Plan prior to 1995	All projects within the Capital Improvements Plan must state whether they are Comprehensive Plan priorities and, so, which specific objectives and policies.	This is a good objective that should remain in the revised Comprehensive Plan. There should be implementing policies that include hurricane evacuation and priority among the priority criteria, especially within the designated urban areas (Urban Coastal District) south of U.S. 41.
Objective 10, *Transportation Element*, The County shall encourage safe and efficient mobility for the rural public.	Develop a program to maintain good hurricane evacuation routes from urban to rural areas	Prior to the adoption of this objective, the County had no formal program that examined the issue of improving hurricane evacuation corridors/roadways in the rural areas.	Hurricane evacuation is a priority for capital improvement programming, particularly roadways that have been identified in the SFHES that are susceptible to LOS failure during a hurricane evacuation event.	This is a good objective, which should remain in the revised Comp. Plan. The County should also address the maintenance and operational needs of the urban roadway system as part of the overall urban/rural hurricane evacuation corridor system.
Objective 7, *Transportation Element*: The County shall develop and adopt standards for safe and efficient ingress and egress to adjoining properties, as well as encourage safe and convenient on-site traffic circulation.	Preserve the ability of the County's main roads to move high volumes of traffic "smoothly."	Access management has been in effect since 1989.	No changes – preservation of capacity of main roadways is still a top priority for the County	This is a good objective, which should remain in the revised Comp. Plan.

Objective	Target	Conditions when Plan was adopted	Current Conditions	Comments
Objective 5: *Transportation Element*: The County will coordinate the Transportation System development process with the Future Land Use Map.	To ensure that the transportation development system is in proper coordination with the Future Land Use Map (FLUM)	The County's Transportation Development System has been in coordination with the FLUM, since 1989.	No changes	This is a good objective, which should remain in the revised Comp. Plan.
Objective 12.2, Conservation & Coastal Management Element: The County shall ensure that building and development activities are carried out in a manner, which minimizes the danger to life and property from hurricanes. The public shall limit its expenditures involving beach and dune restoration and renourishment, road repair, publicly owned seawalls, docking and parking area. All future unimproved requests for development in the coastal high hazard areas will be denied.	Limit public expenditures in the CHHA to avoid promoting population growth and to limit loss of life and public/private property	Prior to the adoption of this objective, Collier County had no formal statement of its stance on such expenditures.	This objective is being implemented	• This is a good objective, which should remain in the revised Comp. Plan. • There should be a monitoring system that will track any public works expenditures within the CHHA • This objective, however, overlooks public expenditure for location –restricted amenities, such as boat ramps or park, which cannot be located elsewhere. Furthermore, there are no alternatives for meeting the public access to coastal waters in the Recreation and Open Space Element. This objective should be revised.

Objective	Target	Conditions when Plan was adopted	Current Conditions	Comments
Objective 12.1, Conservation & Coastal Management Element: Southwest Florida Regional Planning Council Hurricane Evacuation Study Update, and reduce that time frame by 1999, to 27.2 hours.	Maintain and improve evacuation times of evacuees for a Category 3 hurricane	When the Plan was adopted in 1997, evacuation times were assumed to steadily increase	Projected Hurricane evacuation times have decreased from 28.4 hours in 1989 to 27.8 hours in 1995 to 27.2 hours in 1999 to 20.2 in 2001, respectively	This is a good objective, which should remain in the revised Comp. Plan. However, the old projected evacuation times should be updated in the Comp. Plan to reflect the SFRHES 2001 model's results. It should be realized however, that the successes enjoyed in the immediate past may be difficult to repeat as the benefit of additional roads and lanes will eventually not be able to overcome the number of evacuees, which would be generated if the County were not to enforce the current intensity/density regulations within the CHHA.
Objective 12.1, Conservation & Coastal Management Element: Activities will include on-site sheltering for mobile home developments, increased shelter space, and maintenance of equal or lower densities of the Category 1 evacuation zone as defined in the 1996 Southwest Florida Regional Planning Council Hurricane Evacuation Study Update.	Provide adequate shelter space for all evacuees	Because of new school construction, shelter space has increased from 22,400 to 29,610 in Collier County. This is still a deficit of 15,500 spaces from the amount required by 1994	As of November 24, 2003, the situation has greatly improved with the addition of 12,270 spaces consisting of both primary and secondary shelter space for a Category 1 hurricane.	This is a concise, measurable objective, which should remain in the EAR-updated Comprehensive Plan. Unfortunately, SFRHES, 2001 model for this County points to a deficit of shelter spaces for a Category hurricane 2 or greater. This points to a need for more available evacuation shelters (civic buildings, schools, hotels/motels etc.) within close proximity to the populations they serve

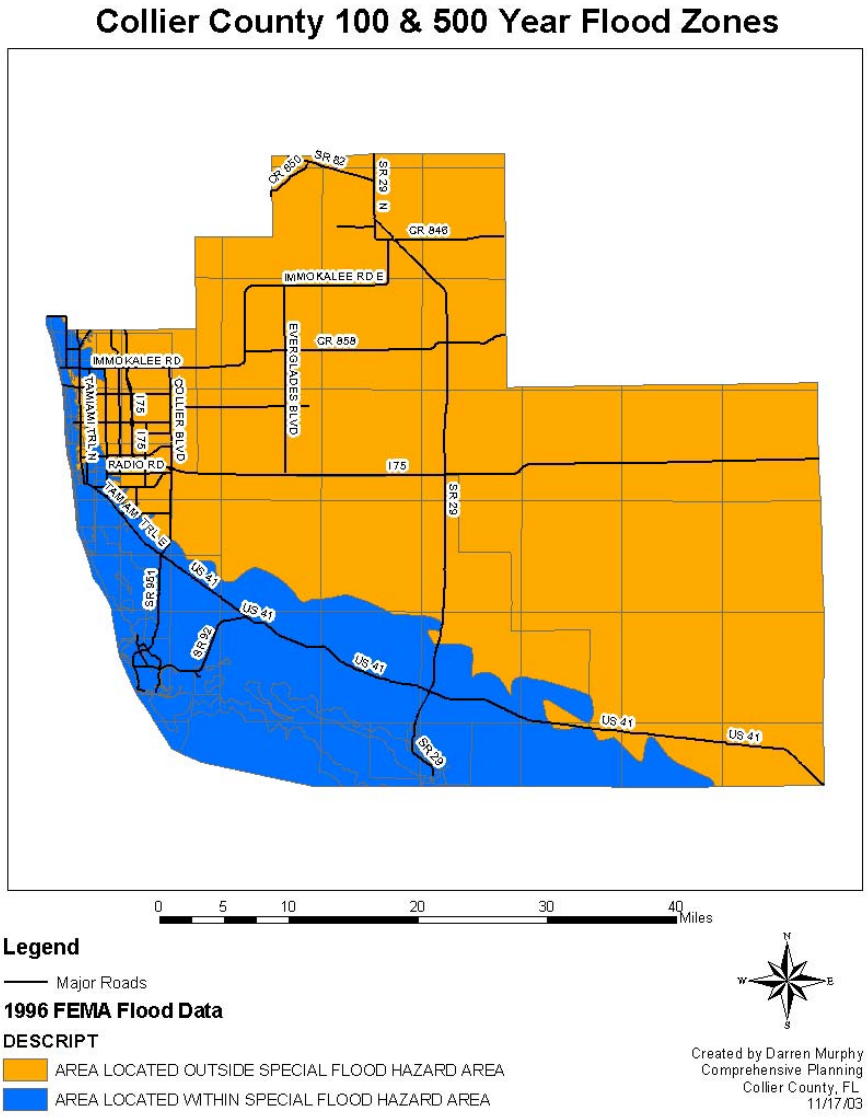
Objective	Target	Conditions when Plan was adopted	Current Conditions	Comments
Objective 1.2, *Intergovernmental Coordination Element*: Coordinate Collier County's land use planning strategy, including an assessment of proposed development, with that of other government and private entities.	Assurance that adjacent governments aren't approving development to the detriment of their neighbors	A major land use planning agreement was adopted by Lee and Collier County in 1992 to address LOS and land use planning issue along the Lee/Collier County boundaries	This is being implemented as Collier County continues to seek input from Lee County regarding facility planning.	This is a good objective, which should remain in the revised Comp. Plan. However, the County should look into whether there should be an interlocal agreement for "all" adjacent governments (Everglades City, City of Marco Island, and the City of Naples) in regards to the approval process for large-scale developments, within the CHHA, that will impose negative impacts on the LOS of roadways/hurricane evacuation corridors in Collier County.

C. Data Assessment and Trends

1. 100, 500-year Floodplains

Collier County possesses many low-lying areas that are subject to periodic freshwater flooding. Such flooding can accompany tropical storms or a hurricane but it can also be the result of sustained heavy rainfall that causes surface sediments to become saturated. Like much of Southwest Florida, Collier County contains numerous river/creeks and wetlands. These natural drainage systems can overflow into their adjacent floodplains creating a sheet flow type flooding, which occasionally causes property, structural and/or agricultural damage and sometimes loss of life. Flooding conditions can sometimes be caused or exacerbated by culverts, bridges, ditches and canals that were improperly constructed on natural floodplains. Map 2.24-1, listed below shows, the 100-year and 500-year floodplains in Collier County.

Map 2.24-1



2. Recent Storm History

Hurricane Donna in 1960 and Hurricane Andrew in 1992 were the last major hurricanes to affect Collier County. The 1995 Hurricane Update has a Hurricane Andrew Fact Sheet that was created by the Collier County Office of Emergency Management. Hurricane Georges in 1998 was the last major storm to threaten Collier County and below is the Collier County Office of Emergency Management Fact Sheet created for that storm threat:

A. Collier County Activation Levels

Level	Date / Time
Level 2	23 Sept. / 5:00
Level 3	23 Sept. / 2:30 p.m.
Level 2	25 Sept. / 11:00 p.m.
Level 1	26 Sept. / 2:00 p.m.

B. State of Local Emergency Declared: 23 Sept. 4:45 p.m.

C. Voluntary Evacuation Issued: 24 Sept. 7:30 a.m.

D. Mandatory Evacuation Issued: 24 Sept. 2:30 p.m.

E. Mandatory Evacuation Areas Included the following:

- All mobile homes/RV Parks
- All areas of Collier County south of U.S. 41 East (Tamiami Trail) extending from SR 29, including all areas with the City of Naples, south of 5th Avenue South.

F. Estimated population within all of the evacuation zones (approximately): 43,000

G. Estimated population who evacuated from the evacuation zones (approximately): 25,000

H. Shelters opened

Special Needs (PSN)

Barron Collier High School – opened September 24, at 2 p.m. and closed September 26th at 12 p.m.

Immokalee Health Department – opened September 24, at 2 p.m. and closed September 26, at 12 p.m.

Total PSN population: 261 at Barron Collier High School and 20 at Immokalee Health Department

General Shelter – opened September 24, at 6 p.m. and closed September 26 at 8 p.m.

Barron Collier High School:	709
Golden Gate Middle School:	468
Oakridge Middle School:	136
Gulf Coast High School:	475
Immokalee High School:	886
Immokalee Middle School:	210

Homeless Shelters

Friendship House, Immokalee
Maverick House, Golden Gate City
First Assembly, East Naples
St. Matthew's House, East Naples

I. Total number of people sheltered:

Special Needs:	218
General:	2,884
Homeless:	250
Total	3,415

J. Estimated time to evacuate: 14 hours

K. Nursing homes/Assisted Care Living Facilities (ACLF), evacuated: 2 hours

ALF

Senior Island Estates, ACLF
Goodlette Arms, ACLF

I. Hospital Evacuated: None

J. Estimated time between evacuation order and tropical storm force winds: 19 hours

K. Closest point of approach to Collier County: 95 miles SSW of Marco Island, FL

L. Estimated lowest barometric pressure: 29.70 inches.

M. Estimated highest wind speeds: Marco Island, 55 mph, gusts to 95 mph

N. Total rainfall: 1-3 inches

O. Storm surge: none

P. State of Local Emergency deactivated: September 26th at 2 p.m.

No damage figures for Hurricane Georges were reported. Past hurricane damage from other hurricanes are as follows: Total estimated cost public and private from Hurricane Andrew and Collier County was $35,000,000. A total of 5,200 properties were affected mostly in the southern half of the county as was expected based on the highest wind speeds as indicated in the fact sheet.

When Hurricane Donna hit Collier County in 1960, the County's population was 15,753 (1960 Census) concentrated primarily in Naples, Immokalee and Everglades City. Except for the Immokalee area, the greater part of the County's inhabited area were inundated by floodwater. Damage in Everglades City was so great that plans to relocate the County seat were finalized, and it was completed in the following year.

Hurricane Alberto was a near miss for the County. This storm formed off the Southwest Florida coast in 1982 but decreased in intensity to such a degree that it was a tropical depression when it made landfall. However, its actions mimicked those proposed by the SLOSH model to the extent that high waters again inundated the Southwest Collier shoreline, submerging Everglades City below approximately three feet of seawater for several hours. There was, however, no surge force resulting in significant damage to property.

Hurricane Floyd provided the area a scare on October 16 1987. However, it veered due east before the County received nay impacts beyond gale force wind guest and somewhat higher tides. A voluntary evacuation order put approximately 600 people in public shelters and an unknown number in area hotels, homes and out of region locations.

3. Status and Trends of Hurricane Evacuation Times

Collier County participated in the updating of the Southwest Florida Regional Hurricane Evacuation Study 2001 (SFRHES) model prepared by the Southwest Regional Planning Council, which assessed Collier County's vulnerability to tropical storms and hurricanes using the Sea, Lake, Overland Surges from Hurricanes (SLOSH) model. The SLOSH model used thirty-three points in the Collier County for time history analysis. These points represent the greatest height of storm water flooding for each category storm. Collier County's hurricane vulnerability zones are shown below in Map 2.24-2, Storm Surge of Land Falling Storms.

One of the primary assumptions of the SFRHES model is the percent evacuating. For example prior to a hurricane evacuation being recommended or ordered, it may be known, based on traffic movements, that 10% of the vulnerable population has evacuated early and that, based on behavioral science, 10% may not evacuate. Therefore, there is an assumption that 80% of the population will evacuate and is used accordingly in the SFRHES model. The primary assumptions and multipliers including occupancy rates discussed in the SFRHES model can be changed particularly if new data becomes

available to support different assumptions or multipliers to fit the specific hurricane scenario threatening Collier County.

The SFRHES model uses these multipliers and assumptions for its Collier County Landfalling Storm model:

Persons per household*	2.31
Vehicles per household*	1.7
Percent evacuating	100%
Percent going to friends or relatives	13%
Percent leaving the region/County	34%
Persons per vehicles**	1.35
Percent going to public shelters	12%

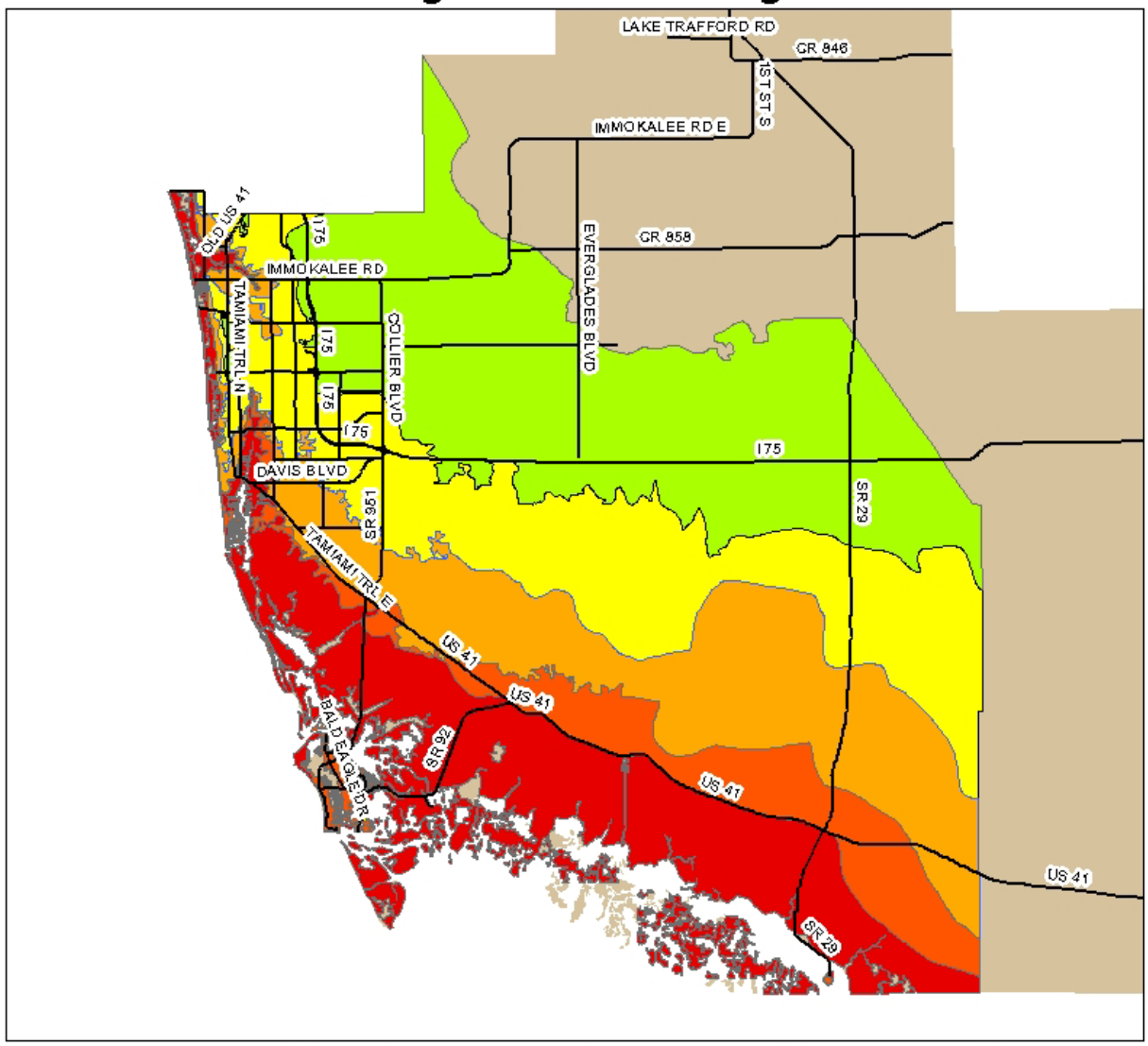
Note:

* These numbers have been updated by staff with the recent publication of the 2000 Census along with using analytical software, PCensus USA, which can customize the geographic area of interest.

** This multiplier was recalculated within the SFRHES 2001 model, due to more recent data provided by the 2000 Census.

Map 2.24-2

Storm Surge of Land Falling Storms



0 4.5 9 18 27 36 Miles

Legend

- Tropical Storm, Landfalling
- Hurricane 1, Landfalling
- Hurricane 2, Landfalling
- Hurricane 3, Landfalling
- Hurricane 4-5, Landfalling
- Collier County, FL
- Major Road

N W E S

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4. Affected Populations

Each hurricane flood zone depicted in Map 2.24-2 encompasses large segments of the County. Each one has a certain degree of vulnerability to the threat of hurricane induced flooding. Therefore, staff has broken down the demographic and socio-economic profiles for each hurricane flood zone based upon the 2000 Census SF1, variables: population, youth/seniors, housing, 1990-2000 Population and 1990-2000 Housing Trend. Please refer to Tables 2.24-1 through 2.24-29

Table 2.24-1

Population Summary	Hurricane Flood Zone: Tropical Storm	
Total Population	34,080	% base
Population/square mile	206.3	
Land area (square miles)	165.2	
Population by Sex	34,080	% base
Male	16,815	49%
Female	17,266	51%
Population By Age	34,080	% base
Under 5 years	1,162	3.40%
5 to 9 years	1,135	3.30%
10 to 14 years	1,125	3.30%
15 to 19 years	1,119	3.30%
20 to 24 years	1,066	3.10%
25 to 34 years	2,656	7.80%
35 to 44 years	3,140	9.20%
45 to 54 years	3,797	11.10%
55 to 59 years	2,753	8.10%
60 to 64 years	3,133	9.20%
65 to 74 years	7,262	21.30%
75 to 84 years	4,641	13.60%
85 years and over	1,093	3.20%
Mean age	52.5	
Median Age	58.3	
Population by Household Type	34,080	% base
Persons living in households	34,363	101%
In family households	26,931	79%
In non-family households	6,787	20%
Persons in group quarters	362	1%
Institutionalized persons	139	0%
Others	223	1%

Table 2.24-2

Persons, Households	Hurricane Flood Zone: Tropical Storm	
Persons in Households	34,363	% base
In family households	26,931	78%
Householder	10,783	31%
Spouse	9,599	28%
Child	4,614	13%
Grandchild	252	1%
Brother or sister	345	1%
Parent	198	1%
Other relatives	466	1%
Nonrelatives	675	2%
In nonfamily households	6,787	20%
Householder living alone	4,820	14%
Householder not living alone	877	3%
Nonrelatives	1,090	3%
Persons per household	2.05	
Persons per family	2.4	
Children per family	0.42	
Households	16,736	% base
Family households	10,930	65%
Married couple families	9,704	58%
With related children	1,403	8%
No related children	8,301	50%
Single parent households	624	4%
Male householder	203	1%
Female householder	421	3%
Other family households	602	4%
Male householder	261	2%
Female householder	341	2%
Nonfamily households	5,806	35%
1 person living alone	4,905	29%
Male householder	1,944	12%
Female householder	2,962	18%
2 or more persons	901	5%
Male householder	574	3%
Female householder	327	2%

Table 2.24-3

Youths, Seniors	Hurricane Flood Zone: Tropical Storm	
Persons Under 18 Years	4,124	% base
In households	4,038	98%
Householder or spouse	7	0%
Child	3,587	87%
Under 6 years	1,196	29%
6 to 11 years	1,223	30%
12 to 17 years	1,168	28%
In married couple family	2,561	62%
In single parent family	1,026	25%
Other relative	329	8%
Nonrelative	115	3%
In group quarters	86	2%
Total Households	16,736	% base
Households with 1 or more persons under 18 years	2,251	13%
Family households	2,216	13%
Nonfamily households	35	0%
Persons 65 and Over	12,996	% base
In family households	9,886	76%
Householder or spouse	9,601	74%
Other relative	258	2%
Nonrelative	27	0%
In nonfamily households	2,996	23%
Householder living alone	2,651	20%
Householder, not alone	192	1%
Nonrelatives	153	1%
In group quarters	113	1%
Total Households	16,736	% base
Households with 1 or more persons 60 and over	10,356	62%
1 person living alone	3,122	19%
Family household	6,926	41%
Nonfamily, 2+ persons	307	2%
Households with 1 or more persons 65 and over	8,631	52%
1 person living alone	2,698	16%
Family household	5,704	34%
Nonfamily, 2+ persons	229	1%
Households with 1 or more persons 75 and over	4,231	25%
1 person living alone	1,589	9%
Family household	2,540	15%
Nonfamily, 2+ persons	102	1%

Table 2.24-4

Housing	Hurricane Flood Zone: Tropical Storm	
Total Housing Units	30,447	% base
Occupied	16,736	55%
Owner occupied	13,155	43%
Renter occupied	3,581	12%
Vacant	13,711	45%
For rent	619	2%
For sale only	393	1%
Rented or sold, not occupied	209	1%
For seasonal, recreational or occasional use	12,313	40%
For migrant workers	23	0%
Other vacant	154	1%

Table 2.24-5

1990-2000 Population	Hurricane Flood Zone: Tropical Storm
Total Population:	
1990 Census	25,609
2000 Census	34,080
Change in population (persons)	8,471
Percentage change in population	24.90%
Under 18 years	
1990 Census	3,279
2000 Census	4,124
Change in Under 18 years	844
% Change in Under 18 years	20.50%
65 years and over	
1990 Census	8,727
2000 Census	12,996
Change in 65 years and over	4,268
% Change in 65 years and over	32.80%

Table 2.24-6

1990-2000 Housing Trend	Hurricane Flood Zone: Tropical Storm
Total Households:	
1990 Census	12,245
2000 Census	16,736
Change in Households	4,491
% Change in Households	26.80%
Total Housing Units:	
1990 Census	23,597
2000 Census	30,447
Change in Housing Units	6,850
% Change in Housing Units	22.50%
Housing Occupancy and Tenure:	
Occupied Units	
Owner Occupied	
1990 Census	8,885
2000 Census	13,155
Change in Owner Occupied Units	4,270
% Change in Owner Occupied Units	32.50%
Renter occupied	
1990 Census	3,360
2000 Census	3,581
Change in Renter Occupied Units	221
% Change in Renter occupied Units	6.20%
Vacant Units	
1990 Census	11,351
2000 Census	13,711
Change in Vacant Units	2,360
% Change in Vacant Units	17.20%
Persons in Households	
1990 Census	25,204
2000 Census	34,363
Change in Persons in Households	9,159
% Change in Persons in Households	26.70%
Single Parent Households	
1990 Census	529
2000 Census	624
Change in Single Parent Households	95
% Change in Single Parent Households	15.30%
One-Person Households	
1990 Census	3,312
2000 Census	4,905
Change in One-Person Households	1,593
% Change in One-Person Households	32.50%

Table 2.24-7

Population Summary	Hurricane Category 1	
Total Population	21,804	% base
Population/square mile	405.1	
Land area (square miles)	53.8	
Population by Sex	21,804	% base
Male	10,842	50%
Female	10,963	50%
Population By Age	21,804	% base
Under 5 years	715	3.30%
5 to 9 years	766	3.50%
10 to 14 years	771	3.50%
15 to 19 years	735	3.40%
20 to 24 years	711	3.30%
25 to 34 years	1,754	8.00%
35 to 44 years	2,398	11.00%
45 to 54 years	2,659	12.20%
55 to 59 years	1,760	8.10%
60 to 64 years	2,012	9.20%
65 to 74 years	4,356	20.00%
75 to 84 years	2,556	11.70%
85 years and over	610	2.80%
Mean age	51.13	
Median Age	56.1	
Population by Household Type	21,804	% base
Persons living in households	21,807	100%
In family households	17,449	80%
In nonfamily households	4,273	20%
Persons in group quarters	82	0%
Institutionalized persons	50	0%
Others	32	0%

Table 2.24-8

Persons, Households	Hurricane Category 1	
Persons in Households	21,807	% base
In family households	17,449	80%
Householder	6,954	32%
Spouse	6,215	28%
Child	3,174	15%
Grandchild	160	1%
Brother or sister	173	1%
Parent	140	1%
Other relatives	263	1%
Nonrelatives	372	2%
In nonfamily households	4,273	20%
Householder living alone	2,818	13%
Householder not living alone	654	3%
Nonrelatives	801	4%
Persons per household	2.08	
Persons per family	2.44	
Children per family	0.45	
Households	10,483	% base
Family households	6,988	67%
Married couple families	6,246	60%
With related children	1,041	10%
No related children	5,206	50%
Single parent households	367	4%
Male householder	112	1%
Female householder	256	2%
Other family households	375	4%
Male householder	158	2%
Female householder	217	2%
Nonfamily households	3,495	33%
1 person living alone	2,839	27%
Male householder	1,219	12%
Female householder	1,621	15%
2 or more persons	655	6%
Male householder	416	4%
Female householder	240	2%

Table 2.24-9

Youths, Seniors	Hurricane Category 1	
Persons Under 18 Years	2,715	% base
In households	2,703	100%
Householder or spouse	7	0%
Child	2,454	90%
Under 6 years	782	29%
6 to 11 years	844	31%
12 to 17 years	828	31%
In married couple family	1,881	69%
In single parent family	573	21%
Other relative	179	7%
Nonrelative	63	2%
In group quarters	12	0%
Total Households	10,483	% base
Households with 1 or more persons under 18 years	1,541	15%
Family households	1,520	15%
Nonfamily households	21	0%
Persons 65 and Over	7,521	% base
In family households	5,815	77%
Householder or spouse	5,591	74%
Other relative	208	3%
Nonrelative	17	0%
In nonfamily households	1,656	22%
Householder living alone	1,452	19%
Householder, not alone	113	2%
Nonrelatives	91	1%
In group quarters	50	1%
Total Households	10,483	% base
Households with 1 or more persons 60 and over	6,080	58%
1 person living alone	1,676	16%
Family household	4,212	40%
Nonfamily, 2+ persons	192	2%
Households with 1 or more persons 65 and over	4,977	47%
1 person living alone	1,464	14%
Family household	3,380	32%
Nonfamily, 2+ persons	133	1%
Households with 1 or more persons 75 and over	2,360	23%
1 person living alone	862	8%
Family household	1,445	14%
Nonfamily, 2+ persons	54	1%

Table 2.24-10

Housing	Hurricane Category 1	
Total Housing Units	17,202	% base
Occupied	10,483	61%
Owner occupied	8,248	48%
Renter occupied	2,236	13%
Vacant	6,718	39%
For rent	329	2%
For sale only	182	1%
Rented or sold, not occupied	126	1%
For seasonal, recreational or occasional use	6,013	35%
For migrant workers	6	0%
Other vacant	63	0%

Table 2.24-11

1990-2000 Population	Hurricane Category 1
Total Population:	
1990 Census	15,547
2000 Census	21,804
Change in population (persons)	6,257
Percentage change in population	28.70%
Under 18 years	
1990 Census	1,879
2000 Census	2,715
Change in Under 18 years	836
% Change in Under 18 years	30.80%
65 years and over	
1990 Census	5,077
2000 Census	7,521
Change in 65 years and over	2,445
% Change in 65 years and over	32.50%

Table 2.24-12

1990-2000 Housing Trend	Hurricane Category 1
Total Households:	
1990 Census	7,218
2000 Census	10,483
Change in Households	3,266
% Change in Households	31.20%
Total Housing Units:	
1990 Census	12,612
2000 Census	17,202
Change in Housing Units	4,590
% Change in Housing Units	26.70%
Housing Occupancy and Tenure:	
Occupied Units	
Owner Occupied	
1990 Census	5,357
2000 Census	8,248
Change in Owner Occupied Units	2,891
% Change in Owner Occupied Units	35.00%
Renter occupied	
1990 Census	1,861
2000 Census	2,236
Change in Renter Occupied Units	375
% Change in Renter occupied Units	16.80%
Vacant Units	
1990 Census	5,395
2000 Census	6,718
Change in Vacant Units	1,324
% Change in Vacant Units	19.70%
Persons in Households	
1990 Census	15,272
2000 Census	21,807
Change in Persons in Households	6,535
% Change in Persons in Households	30.00%
Single Parent Households	
1990 Census	240
2000 Census	367
Change in Single Parent Households	127
% Change in Single Parent Households	34.70%
One-Person Households	
1990 Census	1,791
2000 Census	2,839

1990-2000 Housing Trend	Hurricane Category 1
Change in One-Person Households	1,049
% Change in One-Person Households	36.90%

Table 2.24-13

Population Summary	Hurricane Category 2	
Total Population	55,696	% base
Population/square mile	404	
Land area (square miles)	137.9	
Population by Sex	55,696	% base
Male	27,406	49%
Female	28,290	51%
Population By Age	55,696	% base
Under 5 years	2,364	4.20%
5 to 9 years	2,465	4.40%
10 to 14 years	2,280	4.10%
15 to 19 years	2,426	4.40%
20 to 24 years	2,446	4.40%
25 to 34 years	5,641	10.10%
35 to 44 years	6,300	11.30%
45 to 54 years	5,955	10.70%
55 to 59 years	3,488	6.30%
60 to 64 years	4,143	7.40%
65 to 74 years	9,621	17.30%
75 to 84 years	6,692	12.00%
85 years and over	1,874	3.40%
Mean age	48.39	
Median Age	51.8	
Population by Household Type	55,696	% base
Persons living in households	53,886	97%
In family households	43,383	78%
In nonfamily households	10,649	19%
Persons in group quarters	1,665	3%
Institutionalized persons	1,225	2%
Others	440	1%

Table 2.24-14

Persons, Households	Hurricane Category 2	
Persons in Households	53,886	% base
In family households	43,383	81%
Householder	16,088	30%
Spouse	13,616	25%
Child	9,516	18%
Grandchild	528	1%
Brother or sister	732	1%
Parent	431	1%
Other relatives	1,074	2%
Nonrelatives	1,395	3%
In nonfamily households	10,649	20%
Householder living alone	7,093	13%
Householder not living alone	1,523	3%
Nonrelatives	2,033	4%
Persons per household	2.18	
Persons per family	2.61	
Children per family	0.59	
Households	24,690	% base
Family households	16,089	65%
Married couple families	13,644	55%
With related children	2,773	11%
No related children	10,872	44%
Single parent households	1,263	5%
Male householder	354	1%
Female householder	909	4%
Other family households	1,182	5%
Male householder	459	2%
Female householder	723	3%
Nonfamily households	8,600	35%
1 person living alone	7,091	29%
Male householder	2,525	10%
Female householder	4,567	18%
2 or more persons	1,509	6%
Male householder	931	4%
Female householder	578	2%

Table 2.24-15

Youths, Seniors	Hurricane Category 2	
Persons Under 18 Years	8,569	% base
In households	8,477	99%
Householder or spouse	14	0%
Child	7,428	87%
Under 6 years	2,459	29%
6 to 11 years	2,595	30%
12 to 17 years	2,375	28%
In married couple family	5,305	62%
In single parent family	2,123	25%
Other relative	764	9%
Nonrelative	271	3%
In group quarters	92	1%
Total Households	24,690	% base
Households with 1 or more persons under 18 years	4,502	18%
Family households	4,418	18%
Nonfamily households	84	0%
Persons 65 and Over	18,187	% base
In family households	13,128	72%
Householder or spouse	12,577	69%
Other relative	494	3%
Nonrelative	58	0%
In nonfamily households	4,400	24%
Householder living alone	3,870	21%
Householder, not alone	291	2%
Nonrelatives	239	1%
In group quarters	658	4%
Total Households	24,690	% base
Households with 1 or more persons 60 and over	14,121	57%
1 person living alone	4,509	18%
Family household	9,159	37%
Nonfamily, 2+ persons	453	2%
Households with 1 or more persons 65 and over	11,844	48%
1 person living alone	3,879	16%
Family household	7,616	31%
Nonfamily, 2+ persons	349	1%
Households with 1 or more persons 75 and over	6,015	24%
1 person living alone	2,347	10%
Family household	3,509	14%
Nonfamily, 2+ persons	159	1%

Table 2.24-16

Housing	Hurricane Category 2	
Total Housing Units	34,171	% base
Occupied	24,690	72%
Owner occupied	18,873	55%
Renter occupied	5,817	17%
Vacant	9,481	28%
For rent	734	2%
For sale only	495	1%
Rented or sold, not occupied	240	1%
For seasonal, recreational or occasional use	7,607	22%
For migrant workers	8	0%
Other vacant	397	1%

Table 2.24-17

1990-2000 Population	Hurricane Category 2
Total Population:	
1990 Census	35,428
2000 Census	55,696
Change in population (persons)	20,268
Percentage change in population	36.40%
Under 18 years	
1990 Census	5,283
2000 Census	8,569
Change in Under 18 years	3,287
% Change in Under 18 years	38.40%
65 years and over	
1990 Census	10,702
2000 Census	18,187
Change in 65 years and over	7,484
% Change in 65 years and over	41.20%

Table 2.24-18

1990-2000 Housing Trend	Hurricane Category 2
Total Households:	
1990 Census	15,322
2000 Census	24,690
Change in Households	9,368
% Change in Households	37.90%
Total Housing Units:	
1990 Census	22,799
2000 Census	34,171
Change in Housing Units	11,372
% Change in Housing Units	33.30%
Housing Occupancy and Tenure:	
Occupied Units	
Owner Occupied	
1990 Census	11,081
2000 Census	18,873
Change in Owner Occupied Units	7,792
% Change in Owner Occupied Units	41.30%
Renter occupied	
1990 Census	4,242
2000 Census	5,817
Change in Renter Occupied Units	1,575
% Change in Renter occupied Units	27.10%
Vacant Units	
1990 Census	7,477
2000 Census	9,481
Change in Vacant Units	2,004
% Change in Vacant Units	21.10%
Persons in Households	
1990 Census	33,877
2000 Census	53,886
Change in Persons in Households	20,009
% Change in Persons in Households	37.10%
Single Parent Households	
1990 Census	732
2000 Census	1,263
Change in Single Parent Households	531
% Change in Single Parent Households	42.10%
One-Person Households	
1990 Census	3,964
2000 Census	7,091
Change in One-Person Households	3,127
% Change in One-Person Households	44.10%

Population Summary	Hurricane Category 3	
Total Population	78,990	% base
Population/square mile	319.2	
Land area (square miles)	247.5	
Population by Sex	78,990	% base
Male	38,691	49%
Female	40,299	51%
Population By Age	78,990	% base
Under 5 years	4,316	5.50%
5 to 9 years	4,800	6.10%
10 to 14 years	4,604	5.80%
15 to 19 years	4,155	5.30%
20 to 24 years	3,571	4.50%
25 to 34 years	9,651	12.20%
35 to 44 years	11,503	14.60%
45 to 54 years	9,743	12.30%
55 to 59 years	4,635	5.90%
60 to 64 years	4,675	5.90%
65 to 74 years	10,020	12.70%
75 to 84 years	5,772	7.30%
85 years and over	1,545	2.00%
Mean age	42.32	
Median Age	42.2	
Population by Household Type	78,990	% base
Persons living in households	77,406	98%
In family households	64,793	82%
In nonfamily households	13,151	17%
Persons in group quarters	1,046	1%
Institutionalized persons	661	1%
Others	385	0%

Table 2.24-20

Persons, Households	Hurricane Category 3	
Persons in Households	77,406	% base
In family households	64,793	84%
Householder	22,304	29%
Spouse	18,506	24%
Child	18,133	23%
Grandchild	794	1%
Brother or sister	917	1%
Parent	697	1%
Other relatives	1,444	2%
Nonrelatives	1,997	3%
In nonfamily households	13,151	17%
Householder living alone	8,035	10%
Householder not living alone	2,195	3%
Nonrelatives	2,921	4%
Persons per household	2.4	
Persons per family	2.83	
Children per family	0.82	
Households	32,280	% base
Family households	22,154	69%
Married couple families	18,376	57%
With related children	6,070	19%
No related children	12,306	38%
Single parent households	2,178	7%
Male householder	609	2%
Female householder	1,569	5%
Other family households	1,601	5%
Male householder	612	2%
Female householder	989	3%
Nonfamily households	10,126	31%
1 person living alone	7,944	25%
Male householder	3,011	9%
Female householder	4,933	15%
2 or more persons	2,183	7%
Male householder	1,327	4%
Female householder	855	3%

Table 2.24-21

Youths, Seniors	Hurricane Category 3	
Persons Under 18 Years	16,393	% base
In households	16,318	100%
Householder or spouse	23	0%
Child	14,872	91%
Under 6 years	4,638	28%
6 to 11 years	5,411	33%
12 to 17 years	4,823	29%
In married couple family	11,375	69%
In single parent family	3,497	21%
Other relative	1,032	6%
Nonrelative	390	2%
In group quarters	75	0%
Total Households	32,280	% base
Households with 1 or more persons under 18 years	8,961	28%
Family households	8,818	27%
Nonfamily households	143	0%
Persons 65 and Over	17,337	% base
In family households	12,602	73%
Householder or spouse	11,807	68%
Other relative	747	4%
Nonrelative	48	0%
In nonfamily households	4,107	24%
Householder living alone	3,569	21%
Householder, not alone	292	2%
Nonrelatives	245	1%
In group quarters	628	4%
Total Households	32,280	% base
Households with 1 or more persons 60 and over	13,957	43%
1 person living alone	4,153	13%
Family household	9,332	29%
Nonfamily, 2+ persons	472	1%
Households with 1 or more persons 65 and over	11,340	35%
1 person living alone	3,510	11%
Family household	7,475	23%
Nonfamily, 2+ persons	356	1%
Households with 1 or more persons 75 and over	5,155	16%
1 person living alone	1,897	6%
Family household	3,128	10%
Nonfamily, 2+ persons	130	0%

Table 2.24-22

Housing	Hurricane Category 3	
Total Housing Units	40,997	% base
Occupied	32,280	79%
Owner occupied	23,600	58%
Renter occupied	8,680	21%
Vacant	8,717	21%
For rent	802	2%
For sale only	558	1%
Rented or sold, not occupied	335	1%
For seasonal, recreational or occasional use	6,704	16%
For migrant workers	2	0%
Other vacant	315	1%

Table 2.24-23

1990-2000 Population	Hurricane Category 3
Total Population:	
1990 Census	46,152
2000 Census	78,990
Change in population (persons)	32,838
Percentage change in population	41.60%
Under 18 years	
1990 Census	10,028
2000 Census	16,393
Change in Under 18 years	6,365
% Change in Under 18 years	38.80%
65 years and over	
1990 Census	8,585
2000 Census	17,337
Change in 65 years and over	8,751
% Change in 65 years and over	50.50%

Table 2.24-24

1990-2000 Housing Trend	Hurricane Category 3
Total Households:	
1990 Census	18,280
2000 Census	32,280
Change in Households	14,000
% Change in Households	43.40%
Total Housing Units:	
1990 Census	24,611
2000 Census	40,997
Change in Housing Units	16,387
% Change in Housing Units	40.00%
Housing Occupancy and Tenure:	
Occupied Units	
Owner Occupied	
1990 Census	12,633
2000 Census	23,600
Change in Owner Occupied Units	10,967
% Change in Owner Occupied Units	46.50%
Renter occupied	
1990 Census	5,647
2000 Census	8,680
Change in Renter Occupied Units	3,033
% Change in Renter occupied Units	34.90%
Vacant Units	
1990 Census	6,331
2000 Census	8,717
Change in Vacant Units	2,386
% Change in Vacant Units	27.40%
Persons in Households	
1990 Census	45,371
2000 Census	77,406
Change in Persons in Households	32,035
% Change in Persons in Households	41.40%
Single Parent Households	
1990 Census	1,186
2000 Census	2,178
Change in Single Parent Households	992
% Change in Single Parent Households	45.50%
One-Person Households	
1990 Census	3,785
2000 Census	7,944

1990-2000 Housing Trend	Hurricane Category 3
Change in One-Person Households	4,159
% Change in One-Person Households	52.40%

Table 2.24-25

Population Summary	Hurricane Category 4-5	
Total Population	35,676	% base
Population/square mile	192.6	
Land area (square miles)	185.3	
Population by Sex	35,676	% base
Male	18,013	50%
Female	17,663	50%
Population By Age	35,676	% base
Under 5 years	2,300	6.40%
5 to 9 years	2,725	7.60%
10 to 14 years	2,739	7.70%
15 to 19 years	2,240	6.30%
20 to 24 years	1,415	4.00%
25 to 34 years	4,132	11.60%
35 to 44 years	6,422	18.00%
45 to 54 years	4,962	13.90%
55 to 59 years	2,092	5.90%
60 to 64 years	1,908	5.30%
65 to 74 years	3,255	9.10%
75 to 84 years	1,268	3.60%
85 years and over	217	0.60%
Mean age	37.71	
Median Age	38.5	
Population by Household Type	35,676	% base
Persons living in households	35,302	99%
In family households	32,164	90%
In nonfamily households	3,341	9%
Persons in group quarters	171	0%
Institutionalized persons	62	0%
Others	109	0%

Table 2.24-26

Persons, Households	Hurricane Category 4-5	
Persons in Households	35,302	% base
In family households	32,164	91%
Householder	10,249	29%
Spouse	8,867	25%
Child	10,343	29%
Grandchild	531	2%
Brother or sister	284	1%
Parent	386	1%
Other relatives	674	2%
Nonrelatives	830	2%
In nonfamily households	3,341	9%
Householder living alone	1,788	5%
Householder not living alone	675	2%
Nonrelatives	878	2%
Persons per household	2.81	
Persons per family	3.08	
Children per family	1.02	
Households	12,561	% base
Family households	10,173	81%
Married couple families	8,794	70%
With related children	3,684	29%
No related children	5,111	41%
Single parent households	856	7%
Male householder	277	2%
Female householder	579	5%
Other family households	523	4%
Male householder	221	2%
Female householder	301	2%
Nonfamily households	2,388	19%
1 person living alone	1,717	14%
Male householder	807	6%
Female householder	910	7%
2 or more persons	671	5%
Male householder	444	4%
Female householder	226	2%

Table 2.24-27

Youths, Seniors	Hurricane Category 4-5	
Persons Under 18 Years	9,299	% base
In households	9,275	100%
Householder or spouse	4	0%
Child	8,467	91%
Under 6 years	2,488	27%
6 to 11 years	3,079	33%
12 to 17 years	2,901	31%
In married couple family	6,950	75%
In single parent family	1,517	16%
Other relative	615	7%
Nonrelative	188	2%
In group quarters	24	0%
Total Households	12,561	% base
Households with 1 or more persons under 18 years	4,914	39%
Family households	4,856	39%
Nonfamily households	57	0%
Persons 65 and Over	4,740	% base
In family households	3,966	84%
Householder or spouse	3,508	74%
Other relative	429	9%
Nonrelative	29	1%
In nonfamily households	716	15%
Householder living alone	583	12%
Householder, not alone	78	2%
Nonrelatives	55	1%
In group quarters	58	1%
Total Households	12,561	% base
Households with 1 or more persons 60 and over	4,135	33%
1 person living alone	706	6%
Family household	3,286	26%
Nonfamily, 2+ persons	144	1%
Households with 1 or more persons 65 and over	3,053	24%
1 person living alone	531	4%
Family household	2,429	19%
Nonfamily, 2+ persons	93	1%
Households with 1 or more persons 75 and over	1,085	9%
1 person living alone	228	2%
Family household	832	7%
Nonfamily, 2+ persons	24	0%

Table 2.24-28

Housing	Hurricane Category 4-5	
Total Housing Units	15,101	% base
Occupied	12,561	83%
Owner occupied	11,006	73%
Renter occupied	1,555	10%
Vacant	2,539	17%
For rent	130	1%
For sale only	366	2%
Rented or sold, not occupied	221	1%
For seasonal, recreational or occasional use	1,692	11%
For migrant workers	0	0%
Other vacant	131	1%

Table 2.24-29

1990-2000 Population	Hurricane Category 4-5
Total Population:	
1990 Census	12,634
2000 Census	35,676
Change in population (persons)	23,042
Percentage change in population	64.60%
Under 18 years	
1990 Census	3,477
2000 Census	9,299
Change in Under 18 years	5,822
% Change in Under 18 years	62.60%
65 years and over	
1990 Census	1,142
2000 Census	4,740
Change in 65 years and over	3,598
% Change in 65 years and over	75.90%

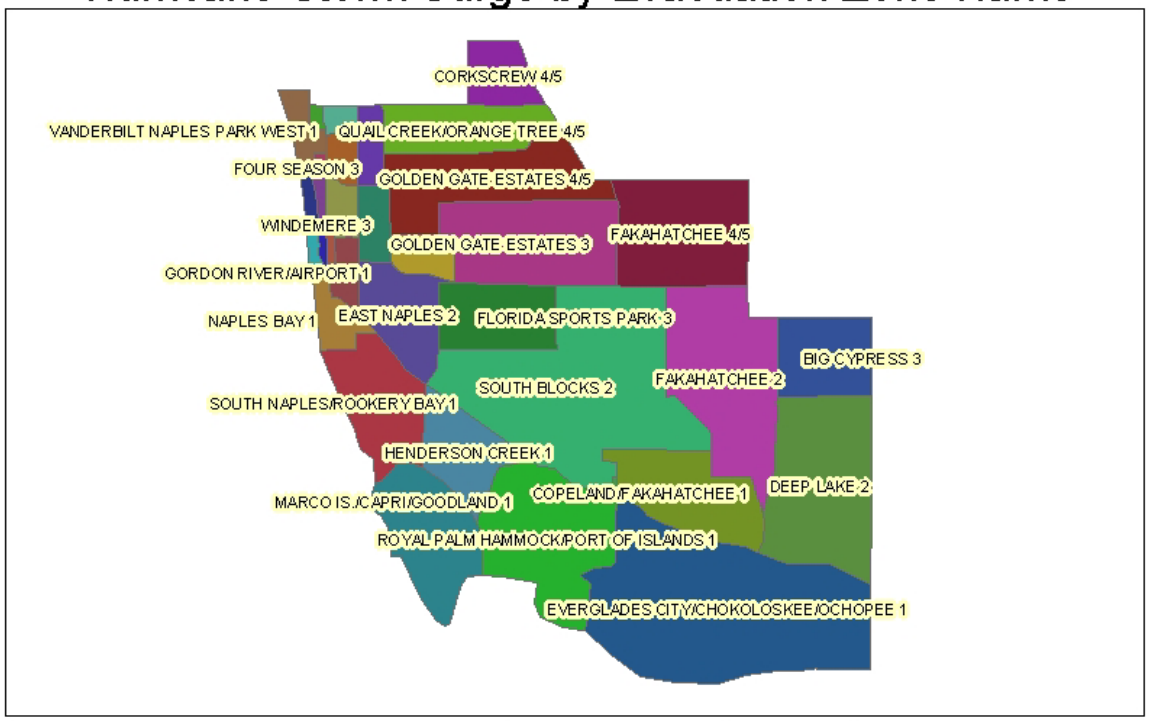
Table 2.24-30

1990-2000 Housing Trend	Hurricane Category 4-5
Total Households:	
1990 Census	4,198
2000 Census	12,561
Change in Households	8,364
% Change in Households	66.60%
Total Housing Units:	
1990 Census	5,108
2000 Census	15,101
Change in Housing Units	9,993
% Change in Housing Units	66.20%
Housing Occupancy and Tenure:	
Occupied Units	
Owner Occupied	
1990 Census	3,520
2000 Census	11,006
Change in Owner Occupied Units	7,485
% Change in Owner Occupied Units	68.00%
Renter occupied	
1990 Census	677
2000 Census	1,555
Change in Renter Occupied Units	878
% Change in Renter occupied Units	56.50%
Vacant Units	
1990 Census	910
2000 Census	2,539
Change in Vacant Units	1,629
% Change in Vacant Units	64.20%
Persons in Households	
1990 Census	12,596
2000 Census	35,302
Change in Persons in Households	22,706
% Change in Persons in Households	64.30%
Single Parent Households	
1990 Census	268
2000 Census	856
Change in Single Parent Households	589
% Change in Single Parent Households	68.80%
One-Person Households	
1990 Census	466
2000 Census	1,717
Change in One-Person Households	1,252
% Change in One-Person Households	72.90%

The SFRHES model estimated that in 2001, there are 149,539 total dwelling units in the areas affected by the worst-case category 4/5-hurricane flooding or required to evacuate due to high winds within the County. The greatest concentrations of these, 41.4%, are located in the category 1 zone. This can be seen in Table 2.24-9, which provides the estimate of dwelling units in the County by category hurricane storm surge zone and by evacuation name. This can be seen in Map 2.24-3 and Table 2.24-31, which provide the estimate of dwelling units in the County by category hurricane storm surge and by evacuation zone.

Map 2.24-3

Hurricane Storm Surge by Evacuation Zone Name



Legend

Hurricane Storm Surge by Evacuation Zone Name

EVAC_ZONE

- AUDUBON 2
- BIG CYPRESS 3
- COPELAND/FAKAHATCHEE 1
- CORKSCREW 4/5
- DEEP LAKE 2
- EAST NAPLES 2
- EVERGLADES CITY/CHOKOLOSKEE/OCHOPEE 1
- FAKAHATCHEE 2
- FAKAHATCHEE 4/5
- FLORIDA SPORTS PARK 3
- FOUR SEASON 3
- GOLDEN GATE CITY 3
- GOLDEN GATE ESTATES 3
- GOLDEN GATE ESTATES 4/5
- GORDON RIVER/AIRPORT 1
- HENDERSON CREEK 1
- HIGH POINT 3
- LANDMARK/OLD 41 3
- MARCO IS./CAPRI/GOODLAND 1
- NAPLES BAY 1
- NAPLES PARK EAST 2
- PALM RIVER/VICTORIA PARK 2
- PARKSHORE/MOORINGS WEST 1
- PARKSHORE/MOORINGS WEST 2
- PELICAN BAY EAST 2
- PELICAN BAY WEST 1
- QUAIL CREEK/ORANGE TREE 4/5
- ROYAL PALM HAMMOCK/PORT OF ISLANDS 1
- SOUTH BLOCKS 2
- SOUTH NAPLES/ROOKERY BAY 1
- TURTLE LAKES/PINE RIDGE 3
- VANDERBILT NAPLES PARK/WEST 1
- WINDEMERE 3

0 3.75 7.5 15 22.5 30 Miles

N W E S

Created by Darren Murphy
Comprehensive Planning
Collier County, FL
11/18/03

Table 2.24-31

COLLIER COUNTY – 2001 HOUSING UNITS LANDFALLING STORM

STORM CATEGORY	EVACUATION ZONE	SINGLE FAMILY	MOBILE HOME	REC. VEHICLES	MULTI-FAMILY	DUPLEX	HOTEL/ MOTEL	TOTAL
1	VANDERBILT/NAPLES PARK WEST	2,498	150	15	4,030	265	818	7,776
1	PELICAN BAY WEST	131	0	0	2,933	2	463	3,529
1	PARK SHORE/MOORING WEST	297	1	0	4,941	24	516	5,779
1	NAPLES BAY	4,636	1,023	46	4,023	635	758	11,121
1	GORDON RIVER/AIRPORT	2,224	69	256	2,192	186	1,222	6,149
1	SOUTH NAPLES/ROOKERY BAY	656	696	492	462	33	90	2,429
1	HENDERSON CREEK	415	2,356	742	1,229	2	0	4,744
1	MARCO ISLAND/CAPRI/GOODLAND	6,431	292	41	8,691	134	2,824	18,413
1	ROYAL PALM HAMMOCK/PORT OF ISLANDS	111	33	190	106	0	189	629
1	EVERGLADES CITY/CHOKOLOSKEE/OCHOPEE	283	274	624	30	22	174	1,407
1	COPELAND/FAKAHATCHEE	13	24	0	13	2	0	52
TOTAL	ZONE 1	17,695	4,918	2,406	28,650	1,305	7,054	62,028
2	AUDUBON	248	5	0	1,077	2	20	1,352
2	PALM RIVER/VICTORIA PARK	1,659	10	0	2,388	58	152	4,267
2	NAPLES PARK EAST	1,877	0	0	243	343	0	2,463
2	PELICAN BAY EAST	1,177	7	0	1,493	18	696	3,391
2	PARK SHORE/MOORINGS EAST	1,979	4	0	1,526	53	734	4,296
2	SOUTH BLOCKS	239	523	0	147	9	0	918
2	FAKAHATCHEE	9	5	0	0	0	0	14
2	DEEP LAKE	45	20	0	2	0	0	67
2	EAST NAPLES	9,313	2,173	573	13,517	673	598	26,847
TOTAL	ZONE 2	16,546	2,747	573	20,393	1,156	2,200	43,615
3	LANDMARK/OLD 41	665	1,141	400	1,072	22	0	3,300
3	TURTLE LAKES/PINE RIDGE	2,776	43	0	3,746	106	135	6,806

STORM	EVACUATION	SINGLE	MOBILE	REC.	MULTI-		HOTEL/	
CATEGORY	ZONE	FAMILY	HOME	VEHICLES	FAMILY	DUPLEX	MOTEL	TOTAL
3	WINDEMERE	2,536	7	0	2,631	79	352	5,605
3	HIGH POINT	1,594	167	34	687	292	268	3,042
3	FOUR SEASONS	2,194	2	0	1,583	4	91	3,874
3	GOLDEN GATE CITY	5,050	37	0	3,370	658	214	9,329
3	GOLDEN GATE ESTATES	2,779	54	0	1	1	0	2,835
3	FLORIDA SPORTS PARK	43	2	0	0	0	380	425
3	BIG CYPRESS	0	0	0	0	0	0	0
TOTAL	ZONE 3	17,637	1,453	434	13,090	1,162	1,440	35,216
STORM	EVACUATION	SINGLE	MOBILE	REC.	MULTI-			
CATEGORY	ZONE	FAMILY	HOME	VEHICLES	FAMILY	DUPLEX		
4/5	CORKSCREW	15	29	0	0	0	0	44
4/5	QUAIL CREEK/ORANGE TREE	1,416	31	0	580	39	0	2,066
4/5	GOLDEN GATE ESTATES	5,358	129	29	781	7	0	6,304
4/5	FAKAHATCHEE	230	36	0	0	0	0	266
TOTAL	ZONE 4/5	7,019	225	29	1,361	46	0	8,680
GRAND TOTALS	ZONES 1 - 4/5	58,897	9,343	3,442	63,494	3,669	10,694	149,539
OUTSIDE ZONES		2,965	2,424	73	1,023	401	129	7,015
COUNTY TOTAL UNITS		**61,862**	**11,767**	**3,515**	**64,517**	**4,070**	**10,823**	**156,554**

Using the telephone survey estimates from the Southwest Florida Regional Planning Council's (SWFRPC) Hurricane Evacuation Study, Update 1987, the Florida Motel/Hotel Association for hotel/motel occupancy and concurrence from the Collier County Emergency Management Office, two estimates of seasonal occupancy for Southwest Florida were prepared. These are as follows in Table 2.24-31:

Table 2.24-32

COLLIER COUNTY
OCCUPANCY RATES BY UNIT TYPE

UNIT TYPE	SEASONAL OCCUPANCY RATES JULY	OCTOBER
SINGLE-FAMILY/DUPLEX	80%	85%
MULTI-FAMILY	57%	71%
MOBILE HOME	43%	75%
TRAVEL TRAILER	18%	41%
HOTEL/MOTEL	54%	63%

From these estimates, Collier County flood zones are estimated in 2001 to contain an aggregated of 232,432 person in July and 273,549 persons at the start of October. This is summarized by the SFRHEC model's evacuation zone in Table 2.24-32. Fortunately, the County's seasonal population increase (October-May) only coincides in the month of October during the tail end of the hurricane season (June-October).

TABLE 2.24-33

COLLIER COUNTY - 2001 POPULATION ESTIMATES LANDFALLING STORM

STORM CATEGORY	EVACUATION ZONE	JULY	OCTOBER
1	VANDERBILT/NAPLES PARK WEST	11,538	13,441
1	PELICAN BAY WEST	4,665	5,720
1	PARK SHORE/MOORINGS WEST	7,710	9,446
1	NAPLES BAY	16,945	19,781
1	GORDON RIVER/AIRPORT	9,000	10,422
1	SOUTH NAPLES/ROOKERY BAY	2,877	3,896
1	HENDERSON CREEK	5,016	7,586
1	MARCO ISLAND/CAPRI/GOODLAND	27,287	31,661
1	ROYAL PALM HAMMOCK/PORT OF ISLANDS	689	900
1	EVERGLADES CITY/CHOKOLOSKEE/OCHOPEE	1,346	1,958
1	COPELAND/FAKAHATCHEE	68	92
	MH & RV 2-5 & BEYOND	7,233	12,860
TOTALS	CATEGORY 1	94,374	117,764
2	AUDUBON	1,902	2,285
2	PALM RIVER/VICTORIA PARK	6,489	7,494
2	NAPLES PARK EAST	4,403	4,737

TABLE 2.24-33			
COLLIER COUNTY - 2001 POPULATION ESTIMATES LANDFALLING STORM			
STORM	EVACUATION		
CATEGORY	ZONE	JULY	OCTOBER
2	PELICAN BAY EAST	5,027	5,795
2	PARK SHORE/MOORINGS EAST	6,655	7,535
2	SOUTH BLOCKS	1,166	1,627
2	FAKAHATCHEE	22	26
2	DEEP LAKE	105	126
2	EAST NAPLES	39,224	46,751
	MH&RV 2	2,954	5,279
	NEW EVACUEES	62,039	71,097
TOTALS	CATEGORY 1-2	156,413	188,861
3	LANDMARK/OLD 41	3,964	5,439
3	TURTLE LAKES/PINE RIDGE	10,424	12,021
3	WINDEMERE	8,705	9,931
3	HIGH POINT	4,883	5,517
3	FOUR SEASONS	6,235	7,017
3	GOLDEN GATE CITY	15,223	17,036
3	GOLDEN GATE ESTATES	5,170	5,530
3	FLORIDA SPORTS PARK	553	638
3	BIG CYPRESS	0	0
	MH&RV 3	1,617	2,916
	NEW EVACUEES	53,540	60,215
TOTALS	CATEGORY 1-3	209,953	249,076
4/5	CORKSCREW	56	79
4/5	QUAIL CREEK/ORANGE TREE	3,468	3,845
4/5	GOLDEN GATE ESTATES	11,035	12,014
4/5	FAKAHATCHEE	459	512
	MH&RV 4/5	235	415
	NEW EVACUEES	14,784	16,035
TOTALS	CATEGORY 1-4/5	224,737	265,111
	OUTSIDE ZONES	7,695	8,438
	TOTAL COUNTY	232,432	273,549

4. Motor Vehicles

As the County's population grows, so too grows the number of motor vehicles which the County's road network will have to handle during an evacuation. With each increasing intensity of storm, the number of vehicles increases, as well. Moreover, to compound the problem, nearly all of the population affected by an incoming hurricane will evacuate by a private vehicle. Issues relevant to this include the number of vehicles owned, whether owners would be willing to leave any vehicles behind, since next to the home, vehicles

are the most expensive possession, whether evacuating families wish to be separated in different in motor vehicles. Based on surveys as part of the SFRHES's model, respondents indicated approximately 75% of available vehicles would be used in an evacuation (Hurricane Evacuation Plan, 1981-82, SWRPC). This averaged out to be 1.7 vehicles per occupied unit.

Using this ratio of cars and the occupancy ratio used previously, the County potential total of vehicles used in an evacuation in July it would be 164,186 and in October it would be 192,359, a 15% increase. Table 2.24-33 summarizes the vehicle generation by each evacuation zone.

TABLE 2.24-34

COLLIER COUNTY - 2001 VEHICLE ESTIMATES LANDFALLING STORM

STORM CATEGORY	EVACUATION ZONE	JULY	OCTOBER
1	VANDERBILT/NAPLES PARK WEST	8,526	9,930
1	PELICAN BAY WEST	3,448	4,228
1	PARK SHORE/MOORINGS WEST	5,699	6,982
1	NAPLES BAY	12,519	14,607
1	GORDON RIVER/AIRPORT	6,620	7,630
1	SOUTH NAPLES/ROOKERY BAY	2,065	2,739
1	HENDERSON CREEK	3,614	5,394
1	MARCO ISLAND/CAPRI/GOODLAND	20,163	23,390
1	ROYAL PALM HAMMOCK/PORT OF ISLANDS	485	611
1	EVERGLADES CITY/CHOKOLOSKEE/OCHOPEE	916	1,268
1	COPELAND/FAKAHATCHEE	51	68
	MH & RV 2-5 & BEYOND	3,725	6,604
TOTALS	CATEGORY 1	67,831	83,451
2	AUDUBON	1,406	1,689
2	PALM RIVER/VICTORIA PARK	4,796	5,539
2	NAPLES PARK EAST	3,255	3,501
2	PELICAN BAY EAST	3,716	4,283
2	PARK SHORE/MOORINGS EAST	4,919	5,569
2	SOUTH BLOCKS	862	1,203
2	FAKAHATCHEE	16	19
2	DEEP LAKE	78	93
2	EAST NAPLES	28,920	34,391
	MH&RV 2	2,111	3,737
	NEW VEHICLES	45,855	52,550
TOTALS	CATEGORY 1-2	113,686	136,001
3	LANDMARK/OLD 41	2,879	3,905
3	TURTLELAKES/PINE RIDGE	7,705	8,885
3	WINDEMERE	6,434	7,340

TABLE 2.24-34			
COLLIER COUNTY - 2001 VEHICLE ESTIMATES LANDFALLING STORM			
STORM	EVACUATION		
CATEGORY	ZONE	JULY	OCTOBER
3	HIGH POINT	3,605	4,068
3	FOUR SEASONS	4,608	5,187
3	GOLDEN GATE CITY	11,252	12,592
3	GOLDEN GATE ESTATES	3,821	4,087
3	FLORIDA SPORTS PARK	409	472
3	BIG CYPRESS	0	0
	MH&RV 3	1,140	2,031
	NEW VEHICLES	39,573	44,506
TOTALS	CATEGORY 1-3	153,259	180,507
4/5	CORKSCREW	42	59
4/5	QUAIL CREEK/ORANGE TREE	2,563	2,842
4/5	GOLDEN GATE ESTATES	8,153	8,871
4/5	FAKAHATCHEE	339	378
	MH&RV 4/5	170	299
	NEW VEHICLES	10,927	11,852
TOTALS	CATEGORY 1-4/5	164,186	192,359

5. Shelters

Simply put, evacuees must have a place to go in the event of hurricane. The SWRPC undertook surveys in 1979, 1981 and 1987 to determine the evacuee preferences. This data is summarized as follows:

Public Shelters	24%
Leaving the County	34%
Visit friends/relatives in County	4%
Go to hotel/motel	2%
Other	2%
Don’t know	21%

Those are preference declarations; other studies indicate there is a significant variation from preference to actual behavior. At this time, the County has seventeen primary public refuges and fifteen secondary public refuges, with a capacity (at 20 square feet/person) of 15,685 and 12,210 persons, respectively. These refuges are summarized in Table 2.24-34.

Table 2.24-35								
2001 COLLIER COUNTY REFUGES LANDFALLING STORM								
			CAPACITY AT					
REFUGE				STORM	FIRST FLOOR		MANAGED	MANAGEMENT
NUMBER	PRIMARY REFUGES	ADDRESS	20 SQ. FT. PER PERSON	CATEGORY (1)	ELEVATION (FT)	RISK/HOST	BY	STATUS
1	Barron Collier High School (2)	Cougar Drive	2,500	2	13.65	Both	County	4 + 8 Health
2	Big Cypress Elementary School	3250 Golden Gate Blvd.	700	3	14.00	Both	County	2
3	Corkscrew Middle School	1065 County Rd. 858	375	Beyond 4/5	18.80	Both	ARC	2
4	Gulf Coast High School (3)	7078 Immokalee Rd.	900	4/5	16.50	Both	County	4 + 8 Health
5	Highlands Elementary School	1101 Lake Trafford Rd., Imm.	700	Beyond 4/5	36.83	Both	ARC	2
6	Immokalee High School	701 Immokalee Road	600	Beyond 4/5	38.00	Both	ARC	4
7	Immokalee Middle School	N. 9th Street	1,200	Beyond 4/5	36.74	Both	ARC	4
8	Lake Trafford Elementary School	3500 Lake Trafford Rd., Imm.	1,200	Beyond 4/5	33.50	Both	ARC	2
9	Laurel Oak Elementary	7800 Immokalee Rd.	700	3	16.50	Both	County	2
10	Lely Elementary School	5256 CR 951	700	2	12.00	Both	County	2
11	Lely High School	Lely Blvd.	2,500	1	9.00	Both	County	2
12	Oakridge Middle School	151 State Rd. 951	1,200	3	16.80	Both	County	2
13	Pine Ridge Middle School	Pine Ridge Road	800	2	12.49	Both	County	2
14	Village Oaks Elementary School	State Route 29	700	Beyond 4/5	29.00	Both	ARC	2

Table 2.24-35								
2001 COLLIER COUNTY REFUGES LANDFALLING STORM								
			CAPACITY AT					
REFUGE			20 SQ. FT.	STORM	FIRST FLOOR		MANAGED	MANAGEMENT
NUMBER	PRIMARY REFUGES	ADDRESS	PER PERSON	CATEGORY (1)	ELEVATION (FT)	RISK/HOST	BY	STATUS
15	Vineyards Elementary School	6225 Arbor Blvd.	700	3	14.50	Both	County	2
16	St. Matthew's House	2001 South Airport Road	110	1	8.50	Both	Inhouse Staff	
17	Friendship House	602 West Main Street	100	Beyond 4/5	37.00	Both	Inhouse Staff	
TOTAL: 17 PRIMARY REFUGES		TOTAL CAPACITY	15,685	PERSONS				
	SECONDARY REFUGES(4)							
1	Avalon Elementary School	Thomasson Drive	700	TS	8.00	Host	County	0
2	East Naples Middle School	4100 Estey Ave.	1,300	1	8.00	Both	County	2
3	Golden Gate Elementary School	20th Place SW	400	2	16.00	Both	County	2
4	Golden Gate Middle School	48th Terrace SW	1,700	2	13.00	Both	County	2
5	Gulfview Middle School	255 6th St.	1,000	1	10.15	Host	County	0
6	Immokalee Health Department (3)	425 No. First St.	50	Beyond 4/5	35.50	Both	County	6 Health
7	Lake Park Elementary School	1446 12th Street, N.	1,000	2	10.50	Host	County	0

Table 2.24-35								
2001 COLLIER COUNTY REFUGES LANDFALLING STORM								
			CAPACITY AT					
REFUGE			20 SQ. FT.	STORM	FIRST FLOOR		MANAGED	MANAGEMENT
NUMBER	PRIMARY REFUGES	ADDRESS	PER PERSON	CATEGORY (1)	ELEVATION (FT)	RISK/HOST	BY	STATUS
8	Manatee Elementary	1880 Manatee Rd.	1,000	TS	5.70	Host	County	0
9	Naples High School	22nd Avenue N.	1,800	1	13.66	Both	County	3
10	Naples Park Elementary School	658 111th Avenue, N.	500	1	10.80	Host	County	0
11	Pelican Marsh Elementary	9480 Airport-Pulling Rd. No.	400	2	13.00	Both	County	2
12	Pinecrest Elementary School	213 S. 9th Street	360	Beyond 4/5	32.35	Both	ARC	2
13	Poinciana Elementary School	2825 Airport Rd.	500	2	10.33	Both	County	2
14	Seagate Elementary School	650 Seagate Drive	700	2	14.00	Host	County	0
15	Shadowlawn Elementary School	2161 Shadowlawn Drive	800	1	8.10	Host	County	0
TOTAL: 15 SECONDARY REFUGES			12,210	PERSONS				
(1)	Zone vulnerability accounts for flood hazards. Number represents that catagory							

Table 2.24-35								
2001 COLLIER COUNTY REFUGES LANDFALLING STORM								
			CAPACITY AT					
REFUGE			20 SQ. FT.	STORM	FIRST FLOOR		MANAGED	MANAGEMENT
NUMBER	PRIMARY REFUGES	ADDRESS	PER PERSON	CATEGORY (1)	ELEVATION (FT)	RISK/HOST	BY	STATUS
	storm							
	and below for which the refuge can be used.							
(2)	Designated as a primary refuge for "special needs" persons.							
(3)	Designated as an alternative to the primary refuge for "special needs" persons.							
(4)	Primary is for pre-storm use while secondary is for post-storm use.							

Based upon the evacuees forecast in TABLE 2.24-32, the County has limited public shelter space capacity. For example, the County can accommodate 16.6% of the evacuees during a Category 1 storm evacuation in July, but only 13.3% in October. Table 2.24-35 summarizes the County's public shelter capacities for the differing storm intensities. These capacities, specifically the "percent met" are ultimately used to determine how many evacuees will have to leave the County because of adequate public or private shelter space cannot be found in the County. The addition of secondary refuges does provide additional space for all evacuees up to a Category 1 Hurricane.

In Collier County, a factor of 12% is assumed based on the 2001 Hazard Management Group, Inc. behavioral survey of Southwest Florida. The 12% is an average of the Category 2 through Category 4 hypothetical response rates for a landfalling storm. The Collier County Emergency Management Office approved this percent. Based on this survey, others conducted after Hurricane Andrew by Florida International University and other before and post hurricane behavioral surveys - including the one conducted for the 1987 Regional Hurricane Evacuation Study Update, there could be a range of 12%-24% seeking shelter. Therefore, staff of the SWRPC used this percentage with confidence in their SFRHES model.

TABLE 2.24-36									
2001 PRIMARY PUBLIC REFUGE CAPACITY LANDFALLING STORM									
STORM		EVACUEES		PERCENT MET		SPACE NEEDED TO OPEN		SURPLUS / DEFICIT	
CATEGORY	SPACE	JULY	OCTOBER	JULY	OCTOBER	JULY	OCTOBER	JULY	OCTOBER
TS*	15,685	13,093	23,613	100.0%	66.4%	1,571	2,834	14,114	12,851
1	15,685	94,374	117,764	16.6%	13.3%	11,325	14,132	4,360	1,553
2	13,075	156,413	188,861	8.4%	6.9%	18,770	22,663	-5,695	-9,588
3	9,075	209,953	249,076	4.3%	3.6%	25,194	29,889	-16,119	-20,814
3**	13,075	209,953	249,076	6.2%	5.2%	25,194	29,889	-12,119	-16,814
4/5***	9,075	224,737	265,111	4.0%	3.4%	26,968	31,813	-17,893	-22,738
2001 PUBLIC REFUGE CAPACITY WITH SECONDARY REFUGES LANDFALLING STORM									
STORM		EVACUEES		PERCENT MET		SPACE NEEDED TO OPEN		SURPLUS / DEFICIT	
CATEGORY	SPACE	JULY	OCTOBER	JULY	OCTOBER	JULY	OCTOBER	JULY	OCTOBER
TS*	27,895	13,093	23,613	100.0%	100.0%	1,571	2,834	26,324	25,061
1	26,195	94,374	117,764	27.8%	22.2%	11,325	14,132	14,870	12,063
2	17,485	156,413	188,861	11.2%	9.3%	18,770	22,663	-1,285	-5,178
3	11,435	209,953	249,076	5.4%	4.6%	25,194	29,889	-13,759	-18,454
3**	17,485	209,953	249,076	8.3%	7.0%	25,194	29,889	-7,709	-12,404
4/5***	11,435	224,737	265,111	5.1%	4.3%	26,968	31,813	-15,533	-20,378
*Mobile home and RV Residents will likely receive advisories to go to shelter									
**Assumes refuges in the category 2 zone remain open.									
***Assumes refuges in the category 3 zone remain open.									

Public shelters within Collier County are not the only means of meeting evacuee shelter needs. Other options for evacuees include friends, hotel/motels and one's own home. In Collier County, there is an estimated 8,814-hotel/motel rooms. The greatest portion (76.6%) is along coast within category 1 flood zone. This leaves 2,033 units for Category 1 storms, and 1,016 units for Category 2 storms. The 2,066 units at 100% vacancy would satisfy 2.2% of the demand in July and 1.8% of demand in November, for a category 1 storm. In category 2 storms, only 0.65% of demand would be met in July and 0.54% in October, while the greater storms eliminate virtually all capacity of commercial space being available. In summary, Table 2.24-36 shows the percent shelter space increase or the amount of evacuees, which can be sheltered due to hotel/motel units providing a form of commercial shelter space.

TABLE 2.24-37

PERCENT REFUGE SPACE INCREASE
DUE TO HOTEL/MOTELS

STORM	PERCENT MET	
CATEGORY	JULY	OCTOBER
TS	100.0%	100.0%
1	2.2%	1.8%
2	0.65%	0.54%
3	0%	0%
4/5	0%	0%

Without public or private commercial space available, evacuees have only the options of using friends within County or leave the County for less affected areas such as areas outside of the storm's probable impact. The shelter capacity of "friends" is limited. This capacity diminishes, as the ratio of evacuees to those not affected increases. This factor is depicted in Table 2.24-37.

TABLE 2.24-38

POPULATION DISPLACEMENT RATIO

STORM	DISPLACED		NOT DISPLACED		RATIO	
CATEGORY	JULY	OCTOBER	JULY	OCTOBER	JULY	OCTOBER
TS	13,093	23,613	219,339	249,936	0.1	0.1
1	94,374	117,764	138,058	155,784	0.7	0.8
2	156,413	188,861	76,018	84,687	2.1	2.2
3	209,953	249,076	22,479	24,473	9.3	10.2
4/5	224,737	265,111	7,695	8,438	29.2	31.4
OUTSIDE			7,695	8,438		

It is an assumption that ratio of 1:1 or better, for example 0.8:1, will enable those seeking shelter with friends will find them. This constitutes 13% of the population. Ratios of worse then 1:1, for example 2:1, will diminish that likelihood in proportion to the ratio. Given the assumption, all of those evacuees from a category 1 storm wishing to stay with friends will be able to do so. However, during a category 2 evacuation, only 6.9% in

July and 6.3% in November of the evacuees will be able to stay with friends. Table 2.24-38 summarizes the percent shelter space increase or the amount of evacuees, which can be sheltered due to friends or relatives providing a form of shelter space.

TABLE 2.24-39		
PERCENT REFUGE SPACE INCREASE		
DUE TO FRIENDS/RELATIVES		
STORM	PERCENT	
CATEGORY	JULY	OCTOBER
TS	13.0%	13.0%
1	13.0%	13.0%
2	6.3%	5.8%
3	1.4%	1.3%
4/5	0.4%	0.4%

These percentages added to the shelter space populations absorb the remainder of the “in County” shelter demand satisfaction. This is summarized in Table 2.24-39. If shelter space cannot be met within the County, they must be met outside of the County. For this reason, Table 2.24-40 summarizes the number of vehicles leaving the County which is derived from subtracting the number of vehicles are staying the County, that is going to a shelter in the County, from the total number of vehicles used in evacuating.

TABLE 2.24-40 The Remainder Of The "In County" Shelter Demand Satisfaction		
STORM	PERCENT MET	
CATEGORY	JULY	OCTOBER
TS	100.0%	100.0%
1	38.8%	33.7%
1(a)	49.9%	42.6%
2	17.0%	14.7%
2(a)	19.8%	17.0%
3	5.9%	5.0%
3(a)	7.0%	6.0%
3*	7.8%	6.6%
3(a)*	9.9%	8.4%
4/5**	4.6%	3.9%
4/5(a)**	5.7%	4.8%
(a) Assumes secondary refuges are open		
*Assumes refuges in the category 2 zone remain open.		
**Assumes refuges in the category 3 zone remain open.		

TABLE 2.24-41		
TOTAL VEHICLES LEAVING		
COLLIER COUNTY		
STORM		
CATEGORY	JULY	OCTOBER
TS	3,290	5,934
1	40,762	54,135
1(a)	32,994	46,366
2	94,050	115,532
2(a)	90,791	112,273
3	144,172	171,229
3(a)	142,428	169,485
3*	141,215	168,272
3(a)*	137,956	165,013
4/5**	156,520	184,621
4/5(a)**	154,775	182,877

6. Special At Risk Population

Within Collier County, there are twenty-nine “locations of concern” that needs special attention, consisting of hospitals and nursing/convalescent homes. Of these locations of concern, over 72% of them were within the Tropical Storm flood zone, Category 1 flood zone or the Category 2 flood zone. This is summarized in Table 2.24-42 listed on the next page.

Table 2.24-42

FACILITY	ADDRESS	ZIP	FACILITY TYPE	SOURCE	LOCATION	CATEGORY
Vanderbilt Beach Retirement	517 100th Av N.	34110	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Heritage Healthcare	777 Ninth Street, N.	34102	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	NAPLES	HEALTHCARE
Senior Island Estates ALF #1	356 Nassau Ct. 34145	34145	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	MARCO ISLAND	HEALTHCARE
Homewood Residence	720 Goodlette Rd. Naples	34102	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	NAPLES	HEALTHCARE
Marco Island Health Care	40 Heathwood Dr. 34145	34145	HOSPITAL	COLLIER CO EOC	MARCO ISLAND	HOSPITAL
Senior Island Estates ALF #2	298 Shadowridge Ct. 34145	34145	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	MARCO ISLAND	HEALTHCARE
Brighton Gardens	7801 Airport Road N.	34110	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Arbor Trace	1000 Arbor Lake Dr.	34105	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Bentley Care Center	875 Retreat Dr.	34110	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Evergreen Manor	602 111 th Ave, N.	34112	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
NHC Health Care	10949 Parnu St.	34105	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
North Collier Hospital	11190 Health Park Dr.	34110	HOSPITAL	COLLIER CO EOC	COLLIER COUNTY	HOSPITAL
Summer House	101 Cypress Way East	34110	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Manor Care	3601 Lakewood Blvd.	34112	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Ridgely Assisted Living	2084 Monroe Ave.	34112	NURSING/CONVELSCENT	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE

Table 2.24-42

FACILITY	ADDRESS	ZIP	FACILITY TYPE	SOURCE	LOCATION	CATEGORY
			CENTERS			
Arden Court ALF	1000 Lely Palms Dr.	34113	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Buena Vida ALF	8901 E. Tamiami Trail	34112	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Lely Palms- Manor Care ALF	1000 Lely Palms Dr.	34113	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Lely Palms- Manor Care Nursing	1000 Lely Palms Dr.	34113	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Harborside Health Care	2900 12th Street, N.	34102	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	NAPLES	HEALTHCARE
Naples Community Hospital	350 7th St. N	34102	HOSPITAL	COLLIER CO EOC	NAPLES	HOSPITAL
Ashbrook Manor	801 97th Ave, N.	34105	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Canterbury House - Bonita	10 7th Street	34110	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
NHC Health Care - Imperial	900 Imperial Golf Course Blvd.	34105	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Premire Place @ Glenview	100 Glenview Place	34105	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	NAPLES	HEALTHCARE
Moorings Park	120 Moorings Park Dr.	34105	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Windsor Court ALF	2626 Goodlette-Frank Rd.	34105	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	NAPLES	HEALTHCARE
Canterbury House - Vinyards	707 Vineyards Blvd.	34119	NURSING/CONVELSCENT CENTERS	COLLIER CO EOC	COLLIER COUNTY	HEALTHCARE
Cleveland Clinic Florida	6101 Pine Ridge Rd. Naples	34119	HOSPITAL	COLLIER CO EOC	COLLIER COUNTY	HOSPITAL

The more troubling issue is looking at the overall demographic trends over the past ten years within all of the five designated hurricane flood zones in Collier County. Looking at the aggregate demographic data of all the five designated hurricane flood zones based upon the selected Census 2000 variables: Population Summary, Census 2000, Seniors, Census 2000, 1990-2000 Population, 65 years and Over, Total Households, Persons in Households. Staff has noted some areas of possible concern:

Population Summary, Census 2000:

- Over 89% of Collier County's population is within each of the five designated hurricane flood zones
- The dominate age bracket is 65 to 74 years, making up 33,835 or 15.10% of the population

Seniors, Census 2000:

- Persons 65 and Over = 59,549
- In nonfamily households, 11,867 live alone
- Households with 1 or more persons 60 and over = 47,839
- Households with 1 or more persons 65 and over = 39,160
- Households with 1 or more persons 75 and over = 18,507

1990-2000 Population:

- 1990 Census = 133,204
- 2000 Census = 223,390
- Change in population (persons) = 90,186
- Percentage change in population = 40.40%

65 years and Over:

- 1990 Census = 33,374
- 2000 Census = 59,549
- Change in 65 years and over = 26,175
- % Change in 65 years and over = 44.00%

Total Households:

- 1990 Census = 56,428
- 2000 Census 95,539
- Change in Households = 39,111
- % Change in Households = 40.90%

Persons in Households:

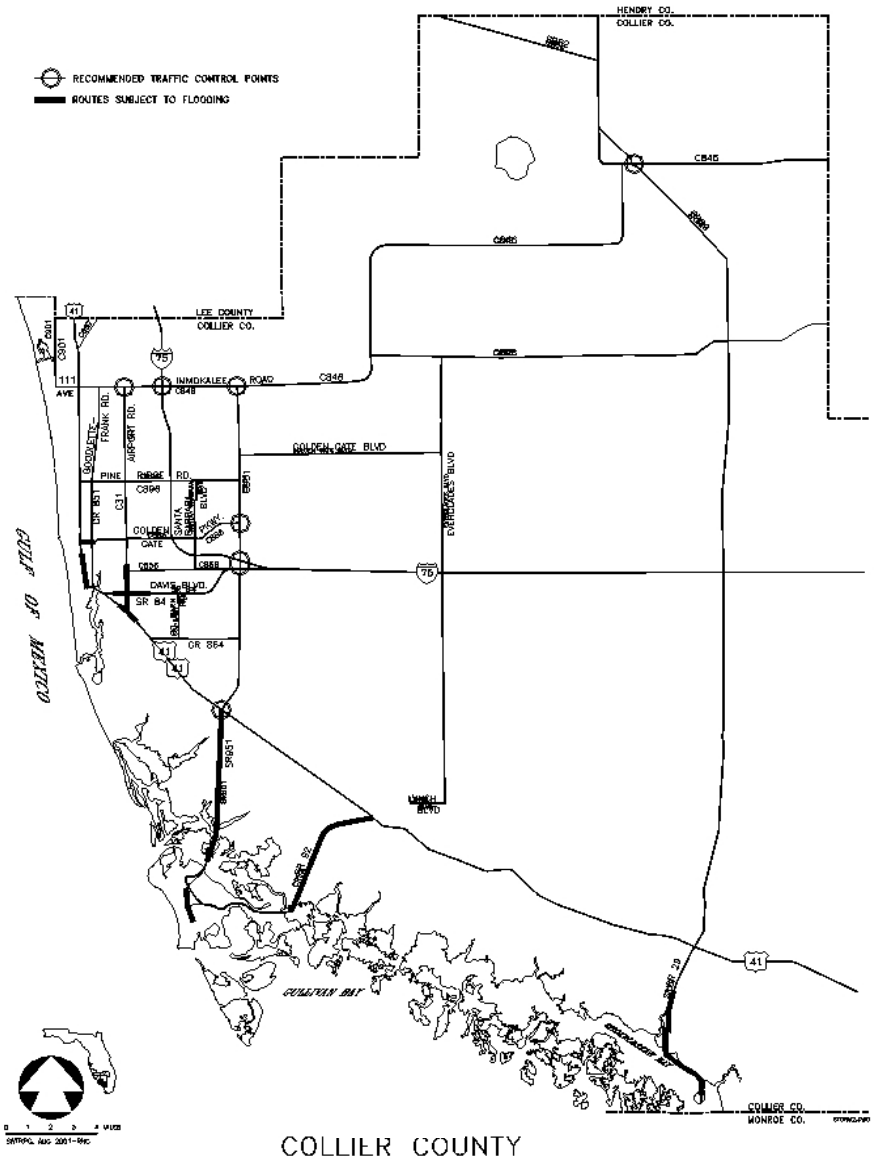
- 1990 Census = 130,172
- 2000 Census = 220,344
- Change in Persons in Households = 90,172
- % Change in Persons in Households = 40.90%

To reiterate staffs concerns about special at risk populations, it's alarming that of the five hurricane flood zones. The third largest percent change of people 65 and over, since the Census taken in 1990, has occurred within the Tropical Storm, hurricane flood zone, which is the most flood-prone area within Collier County.

7. Routes

Arterial roadways form the backbone of any hurricane evacuation effort. Unfortunately, Collier County's roadways system provides relatively few options for evacuees coming from the coast. Those that do exist are depicted on Map 2.24-4, "Evacuation Routes," on the next page. Identification of routes is the first step in assessing the roadway system. The next step is assessing roadways capacities. The capacities of these roadways have been developed based on their characteristic as defined in the Collier County Roadways Service Volumes 1997 report, except for interstate, local road and rural highway volumes, which are from the Florida Level of Service Tables and Standards Handbook, 1998, by the Florida Department of Transportation. Directional split ration are adjusted based on pages 8-6, of the 1998 Highway Capacity Manual. These directional splits are provided to address the time of day in which an evacuation may take place. 50/50 being the lowest and representing capacities during the middle of a workweek day, 70/30 being an intermediate capacity during a weekend day and 90/10 being a quick capacity which might occur after 9 p.m. at night. These capacities are contained in Table 2.24-43. These capacities show the roadways vary from a high hourly capacity at Service Level D of 5,680 trips for an eight-lane section of U.S. 41, to a low of 700 trips on extreme western portion of Bonita Beach Rd.

Map 2.24-4



COLLIER COUNTY
EVACUATION ROUTES

Table 2.24-43

2001 EVACUATION ROUTE CAPACITIES

COLLIER COUNTY

				PEAK HOUR	PEAK HOUR			
				PK. DIR.	TWO-WAY	TRAFFIC FLOW SPLIT**		
	#	ROAD	SIGNAL	CAPACITY	CAPACITY	(EVAC. DIR./OTHER DIR.)		
LINK	LANES	TYPE	CLASS	(LOS D)*	(LOS D)*	50/50	70/30	90/10
I -75								
Lee County to CR 951 (Isle of Capri Rd.)	4	Freeway	2	3,270		N/A	N/A	N/A
CR 951 (Isle of Capri Rd.) to SR 29	4	Freeway	Rural	3,220		N/A	N/A	N/A
SR 29 to Broward County	4	Freeway	Rural	3,220		N/A	N/A	N/A
US 41								
Lee County to Old U.S. 41	4	Arterial	I	2,480		N/A	N/A	N/A
Old U.S. 41 to CR 846 (Immokalee Rd.)	4	Arterial	I	2,060		N/A	N/A	N/A
CR 846 (Immokalee Rd.) to Gulf Park Dr.	4	Arterial	I	2,310		N/A	N/A	N/A
Gulf Park Dr. to CR 886 (Golden Gate Pkwy.)	6	Arterial	II	3,090		N/A	N/A	N/A
CR 886 (Golden Gate Pkwy.) to 10th Ave. N.	6	Arterial	II	3,720		N/A	N/A	N/A
10th Ave. N. to Central Ave.	6	Arterial	II	2,680		N/A	N/A	N/A
Central Ave. to "Four Corners"	6	Arterial	II	3,050		N/A	N/A	N/A
"Four Corners" to CR 851 (Goodlette-Frank Rd.)	6	Arterial	II	2,160		N/A	N/A	N/A
CR 851 (Goodlette-Frank Rd.) to SR 84 (Davis Blvd.)	8	Arterial	II	5,680		N/A	N/A	N/A

SR 84 (Davis Blvd.) to Airport Rd.	6	Arterial	II	2,560		N/A	N/A	N/A
Airport Rd. to CR 864 (Rattlesnake Hammock Rd.)	6	Arterial	II	3,000		N/A	N/A	N/A
CR 864 (Ratt. Ham. Rd.) to SR 951 (Isle of Capri Rd.)	4	Arterial	I	3,280		N/A	N/A	N/A
SR 951 (Isle of Capri Rd.) to Dade County	2	Rural Hwy	55 mph	1,230	2,160	1,080	1,346	1,458
SR 29								
Hendry County to CR 29A North	2	Rural Hwy	55 mph	1,230	2,160	1,080	1,346	1,458
CR 29A North to four lane end	2	Arterial	I	980	1,790	895	1,115	1,208
Four lane end to CR 29A South	4	Arterial	II	1,890		N/A	N/A	N/A
CR 29A South to US 41	2	Rural Hwy	55 mph	1,230	2,160	1,080	1,346	1,458
SR 82								
Lee County to SR 29	2	Rural Hwy	55 mph	1,230	2,160	1,080	1,346	1,458
SR 84 (DAVIS BOULEVARD)								
US 41 to CR 31 (Airport Rd.)	6	Arterial	II	2,410		N/A	N/A	N/A
CR 31 (Airport Rd.) to County Barn Rd.	4	Arterial	I	2,610		N/A	N/A	N/A
County Barn Rd. to Santa Barbara Blvd.	4	Arterial	I	2,610		N/A	N/A	N/A
Santa Barbara Blvd. to CR 951 (Isle of Capri Rd.)	2	Arterial	II	1,370	2,250	1,125	1,402	1,519
SR 92								
US 41 to SR 951 (Isle of Capri Rd.)	2	Local		1,060	1,890	945	1,177	1,276
SR 951 (ISLE OF CAPRI ROAD)								
US 41 to Manatee Rd.	4	Arterial	I	2,120		N/A	N/A	N/A
Manatee Rd. to New York Dr.	4	Arterial	I	3,060		N/A	N/A	N/A
New York Dr. including Marco Island Bridge	2	Arterial	I	1,380	1,790	895	1,115	1,208
Marco Island Bridge to CR 953	4	Arterial	I	1,940		N/A	N/A	N/A
CR 953 to CR 92	4	Arterial	I	2,080		N/A	N/A	N/A

CR 29								
US 41 to Chokoloskee Island	2	Rural Hwy	55 mph	1,060	1,890	945	1,177	1,276
				PEAK HOUR	PEAK HOUR			
				PK. DIR.	TWO-WAY	TRAFFIC FLOW SPLIT**		
	#	ROAD	SIGNAL	CAPACITY	CAPACITY	(EVAC. DIR./OTHER DIR.)		
LINK	LANES	TYPE	CLASS	(LOS D)*	(LOS D)*	50/50	70/30	90/10
CR 31 (AIRPORT ROAD)								
CR 846 (Immokalee Rd.) to CR 896 (Pine Ridge Rd.)	4	Arterial	I	2,000		N/A	N/A	N/A
CR 896 (Pine Ridge Rd.) to CR 856 (Radio Rd.)	6	Arterial	II	2,810		N/A	N/A	N/A
CR 856 (Radio Rd.) to US 41	6	Arterial	I	2,280		N/A	N/A	N/A
111th AVENUE NORTH								
CR 901 (Vanderbilt Dr.) to US 41	2	Local		920	1,630	815	1,015	1,100
CR 846 (IMMOKALEE ROAD)								
US 41 to I-75	4	Arterial	I	2,640		N/A	N/A	N/A
I-75 to CR 951 (Isle of Capri Rd.)	2	Arterial	I	1,130	2,170	1,085	1,352	1,465
CR 951 (Isle of Capri Rd.) to County Line	2	Rural Hwy	55 mph	1,060	1,890	945	1,177	1,276
CR 851 (GOODLETTE-FRANK ROAD)								
Carica Rd. to CR 896 (Pine Ridge Rd.)	2	Arterial	I	1,240	2,060	N/A	N/A	N/A
CR 896 (Pine Ridge Rd.) to Solana Rd.	4	Arterial	I	2,390		N/A	N/A	N/A
Solana Rd. to CR 886 (Golden Gate Pkwy.)	4	Arterial	I	2,390		N/A	N/A	N/A
CR 886 (Golden Gate Pkwy.) to US 41	6	Arterial	II	2,760		N/A	N/A	N/A
CR 856 (RADIO ROAD)								

CR 31 (Airport Rd.) to Santa Barbara Blvd.	4	Arterial	I	2,610		N/A	N/A	N/A
Santa Barbara Blvd. to SR 84 (Davis Blvd.)	2	Arterial	I	1,020	1,860	N/A	N/A	N/A
CR 858								
CR 846 (Immokalee Rd.) to Hendry County	2	Rural Hwy	55 mph	1,230	2,160	1,080	1,346	1,458
CR 864 (RATTLESNAKE HAMMOCK ROAD)								
Bayshore Road to US 41	2	Local		920	1,630	815	1,015	1,100
US 41 to St. Andrews Blvd.	4	Local		1,830	3,270	1,635	2,037	2,207
St. Andrews Blvd. to CR 951 (Isle of Capri Rd.)	2	Local		920	1,630	815	1,015	1,100
CR 886 (GOLDEN GATE PARKWAY)								
US 41 to CR 851 (Goodlette-Frank Rd.)	6	Arterial	II	2,220		N/A	N/A	N/A
CR 851 (Goodlette-Frank Rd.) to CR 31 (Airport Rd.)	6	Arterial	I	3,150		N/A	N/A	N/A
CR 31 (Airport Rd.) to Santa Barbara Blvd.	4	Arterial	I	2,270		N/A	N/A	N/A
Santa Barbara Blvd. to CR 951 (Isle of Capri Rd.)	4	Arterial	II	1,450		N/A	N/A	N/A
CR 887 (OLD US 41)								
Lee County to US 41	2	Local		920	1,630	815	1,015	1,100
CR 896 (PINE RIDGE ROAD)								
US 41 to CR 851 (Goodlette-Frank Rd.)	6	Arterial	II	2,120		N/A	N/A	N/A
CR 851 (Goodlette-Frank Rd.) to CR 31 (Airport Rd.)	6	Arterial	II	2,750		N/A	N/A	N/A
CR 31 (Airport Rd.) to I 75	4	Arterial	II	1,920		N/A	N/A	N/A
I 75 to CR 951 (Isle of Capri Rd.)	4	Arterial	I	2,640		N/A	N/A	N/A
CR 901 (VANDERBILT DRIVE)								
Bonita Beach Rd. to 111th Ave. N.	2	Local		920	1,630	815	1,015	1,100
				PEAK	PEAK			

				HOUR	HOUR			
				PK. DIR.	TWO-WAY	TRAFFIC FLOW SPLIT**		
	#	ROAD	SIGNAL	CAPACITY	CAPACITY	(EVAC. DIR./OTHER DIR.)		
LINK	LANES	TYPE	CLASS	(LOS D)*	(LOS D)*	50/50	70/30	90/10
CR 862 (VANDERBILT BEACH ROAD)								
Gulfshore Drive to US 41	2	Arterial	I	770	1,360	N/A	N/A	N/A
US 41 to Goodlette-Frank Road	4	Arterial	I	1,610		N/A	N/A	N/A
Goodlette-Frank Road to Airport Road	4	Arterial	I	2,380		N/A	N/A	N/A
Airport Rd. to CR 951	2	Arterial	I	1,100	1,830	915	1,140	1,235
CR 951 (ISLE OF CAPRI ROAD)								
CR 846 (Immokalee Rd.) to CR 886 (Golden Gate Pkwy.)	2	Rural Hwy	55 mph	1,190	2,140	1,070	1,333	1,445
CR 886 (Golden Gate Pkwy.) to SR 84 (Davis Blvd.)	4	Rural Hwy		2,600		N/A	N/A	N/A
SR 84 (Davis Blvd.) to US 41	4	Rural Hwy	55 mph	2,570	4,290	2,145	2,673	2,896
SANTA BARBARA/GREEN/LOGAN BOULEVARD								
CR 896 (Pine Ridge Rd.) to CR 856 (Radio Rd.)	4	Arterial	I	2,060		N/A	N/A	N/A
Radio Road to Davis Blvd.	4	Arterial	I	1,380		N/A	N/A	N/A
COUNTY BARN ROAD								
SR 84 (Davis Blvd.) to CR 864 (Ratt. Ham. Rd.)	2	Local		920	1,630	815	1,015	1,100
GOLDEN GATE BOULEVARD								
CR 951 (Isle of Capri Rd.) to Everglades Blvd.	2	Local	Rural	920	1,630	815	1,015	1,100
EVERGLADES BOULEVARD								
CR 858 to Lynch Blvd.	2	Local	Rural	920	1,630	815	1,015	1,100

Bonita Beach Rd.								
Hickory Blvd. to Vanderbilt Dr.	2LU	Arterial	BB	812	1,400	700	872	945
Vanderbilt Dr. to US 41	4LD	Arterial	BB	1,723		N/A	N/A	N/A
US 41 to I 75	4LD	Arterial	AA	2,071		N/A	N/A	N/A

*Service volumes are from the report "Collier County Roadway Service Volumes", 1997, except for interstate, local road and rural highway volumes, which are from "Florida's Level of Service Tables and Standards Handbook", 1998, by the Florida Department of Transportation.

**Adjusted based on directional split ratios identified on Page 8-6, of the 1998 Highway Capacity Manual

An important aspect of any route is its condition. Many routes along the coastline are low lying. Their propensity to flood due to surge or tidal action causes their reliability to operate as an evacuation route to cease several hours before storm landfall. In most cases, however, winds, not shoreline flooding, will initially make roads unsafe for travel.

Rainfall flooding, however, may constitute a greater hazard to evacuation route operation than either early shoreline flooding or early winds. This is because roadways may flood and become partially or totally impassable early in an evacuation. Such areas have been documented for different storms and are also depicted on Map 2.24-4. These areas must be identified and bypassed before the presupposed onset of heavy rains, which is forecasted by the National Weather Service.

8. Clearance Times

There are several factors taken into account when calculating evacuation zone clearance times. The first is the nature of the threat of natural elements. These include gale force winds preceding the storm; sustained rains that reduce visibility, flooded roadways, and storm surge flooding that precede the storm.

The number of vehicles leaving a zone and the capacity of the route(s) to carry traffic are both assessments that serve as a basis for determining clearance times. It is expressed in hours, which is the number of hours needed to move cars and people past a given point. In effect, the vehicles from Table 2.24-34 are divided by the capacity of the applicable route in Table 2.24-43 to arrive at specific clearance times. The worst route, that is most limited in capacity, is the determining factor. Table 2.24-44 depicts this for each zone. These clearance times are based on a primary assumption that the evacuation routes are operating at capacity for the entire time it take for all the assumed vehicles to clear the route.

Table 2.24-44

2001 TIME TO CLEAR LANDFALLING STORM

STORM	EVACUATION		JULY			OCTOBER			TO COUNTY
CATEGORY	ZONE	RESTRICTING POINT(S)	SLOW	INTMED	QUICK	SLOW	INTMED	QUICK	LINE
1	VANDERBILT/NAPLES PARK WEST	CR 846, Bonita Beach & CR 862	2.1	2.0	1.9	2.4	2.3	2.3	.1
1	PELICAN BAY WEST	CR 846, CR 862 & CR 896	2.6	2.5	2.4	3.1	3.0	2.9	.1
1	PARK SHORE/MOORINGS WEST	CR 896 & CR 886	2.7	2.7	2.7	3.3	3.3	3.3	.2
1	NAPLES BAY	SR 84 & US 41	4.5	4.1	4.0	5.2	4.8	4.7	.2
1	GORDON RIVER/AIRPORT	CR 896, CR 886 & SR84	3.7	3.5	3.5	4.4	4.2	4.1	.2
1	SOUTH NAPLES/ROOKERY BAY	CR 951 & US 41	3.3	3.0	2.9	4.2	3.8	3.6	.3
1	HENDERSON CREEK	CR 951 & US 41	3.3	3.0	2.9	4.2	3.8	3.6	.3
1	MARCO ISLAND/CAPRI/GOODLAND	SR 951 (Bridge) & SR 92	11.0	8.8	8.1	12.7	10.2	9.4	.5
1	MARCO ISLAND/CAPRI/GOODLAND	SR 951 (One-Way Bridge) & SR 92	7.0	6.4	6.2	8.1	7.5	7.2	.5
1	MARCO ISLAND/CAPRI/GOODLAND	SR 951 (One-Way Bridge) & SR 92 One-Way	5.2	5.2	5.2	6.0	6.0	6.0	.5
1	ROYAL PALM HAMMOCK/PORT OF ISLANDS	SR 29	1.3	1.1	1.0	1.8	1.4	1.3	.5
1	EVERGLADES CITY/CHOKOLOSKEE/OCHOPEE	SR 29	1.3	1.1	1.0	1.8	1.4	1.3	.8
1	COPELAND/FAKAHATCHEE	SR 29	1.3	1.1	1.0	1.8	1.4	1.3	.7
2	AUDUBON	Bonita Beach	2.5	2.5	2.5	2.9	2.9	2.9	.1
2	PALM RIVER/VICTORIA PARK	CR 846 & CR 862	5.2	4.9	4.8	6.0	5.6	5.5	.1
2	NAPLES PARK EAST	CR 846 & CR 862	5.2	4.9	4.8	6.0	5.6	5.5	.1
2	PELICAN BAY EAST	CR 846, CR 862 & CR 896	5.2	5.0	4.9	6.0	5.8	5.7	.1
2	PARK SHORE/MOORINGS EAST	CR 896 & CR 886	4.2	4.2	4.2	4.9	4.9	4.9	.2
2	SOUTH BLOCKS	Everglades Blvd.	1.1	0.8	0.8	1.5	1.2	1.1	.5
2	FAKAHATCHEE	SR 29	1.4	1.1	1.1	1.9	1.5	1.4	.3
2	DEEP LAKE	SR 29	1.4	1.1	1.1	1.9	1.5	1.4	1.2
2	EAST NAPLES	CR 951 & CR 31	9.5	8.4	8.1	11.3	10.1	9.7	.3

3	LANDMARK/OLD 41	Bonita Beach	4.1	4.1	4.1	5.2	5.2	5.2	.1
3	TURTLELAKES/PINE RIDGE	CR 846, CR 862 & CR 896	8.6	8.2	8.1	9.9	9.5	9.3	.1
3	WINDEMERE	CR 896, CR 862 & CR 886	8.6	8.3	8.1	10.0	9.6	9.4	.1
3	HIGH POINT	CR 896 & CR 886	6.7	6.7	6.7	7.7	7.7	7.7	.1
3	FOUR SEASONS	CR 846 & CR 862	7.8	7.4	7.2	9.0	8.4	8.2	.1
3	GOLDEN GATE CITY	CR 951 & Santa Barbara	3.5	3.5	3.5	3.9	3.9	3.9	.2
3	GOLDEN GATE ESTATES	Everglades & Golden Gate Blvds.	2.9	2.3	2.1	3.2	2.6	2.4	.3
STORM	EVACUATION		JULY			OCTOBER			TO COUNTY
CATEGORY	ZONE	RESTRICTING POINT(S)	SLOW	INTMED	QUICK	SLOW	INTMED	QUICK	LINE
3	FLORIDA SPORTS PARK	CR 951	13.0	10.4	9.6	15.6	12.5	11.5	.2
3	BIG CYPRESS	SR 29	1.4	1.1	1.1	1.9	1.5	1.4	.6
4/5	CORKSCREW	CR 846	7.1	5.7	5.2	7.8	6.2	9.2	.3
4/5	QUAIL CREEK/ORANGE TREE	CR 846	7.1	5.7	5.2	7.8	6.2	5.8	.2
4/5	GOLDEN GATE ESTATES	CR 846 & Golden Gate Blvds.	6.1	4.9	4.5	6.7	5.4	5.0	.3
4/5	FAKAHATCHEE	SR 29	1.7	1.4	1.3	2.3	1.8	1.7	.4
	Denotes traffic management option, in order to reduce time.								

Travel time to a destination is another factor in calculating evacuation times. There are a number of destinations possible: public shelters in the County, friends in the County and any destination outside the County. Table 2.24-45 describes times to shelters and the far right column in Table 2.24-44 describes time to clear the County line.

TABLE 2.24-45

SHELTER DESIGNATIONS AND OPTIONS

CATEGORY	EVACUATION ZONE	SHELTER NAME	ESTIMATED TRAVEL TIME
1	VANDERBILT/NAPLES PARK WEST	Laurel Oak Elementary*+	0.5 hour
1	PELICAN BAY WEST	Pine Ridge Middle School***	0.25 hour
1	PARK SHORE/MOORINGS WEST	Pine Ridge Middle School***	0.25 hour
1	NAPLES BAY	St. Matthew's House**	0.25 hour
1	GORDON RIVER/AIRPORT	St. Matthew's House**	0.25 hour
1	SOUTH NAPLES/ROOKERY BAY	Lely High School**	0.25 hour
1	HENDERSON CREEK	Lely Elementary School***	0.25 hour
1	MARCO ISLAND/CAPRI/GOODLAND	Lely Elementary School***	0.5 hour
		Lely High School**	0.5 hour
		Golden Gate Shelters**	0.5 hour
		Immokalee Shelters	1.0 hour
1	ROYAL PALM HAMMOCK/PORT OF ISLANDS	Lely Elementary School***	0.5 hour
		Lely High School**	0.5 hour
1	EVERGLADES CITY/CHOKOLOSKEE/OCHOPEE	Immokalee Shelters	0.75 hour
1	COPELAND/FAKAHATCHEE	Immokalee Shelters	0.75 hour
2	AUDUBON	Laurel Oak Elementary*+	0.25 hour
2	PALM RIVER/VICTORIA PARK	Vineyards Elementary School*+	0.25 hour
2	NAPLES PARK EAST	Vineyards Elementary School*+	0.25 hour
2	PELICAN BAY EAST	Pine Ridge Middle School***	0.25 hour
2	PARK SHORE/MOORINGS EAST	Pine Ridge Middle School***	0.25 hour
2	SOUTH BLOCKS	Immokalee Shelters	0.75 hour
2	FAKAHATCHEE	Immokalee Shelters	0.75 hour
2	DEEP LAKE	Immokalee Shelters	0.75 hour
2	EAST NAPLES	Golden Gate Shelters**	0.25 hour
		Immokalee Shelters	1.0 hour
3	LANDMARK/OLD 41	Oakridge Middle School*+	0.5 hour
3	TURTLE LAKES/PINE RIDGE	Vineyards Elementary School*+	0.25 hour
3	WINDEMERE	Vineyards Elementary School*+	0.25 hour
3	HIGH POINT	Big Cypress Elementary School*+	0.5 hour
		Golden Gate Shelters**	0.5 hour
3	FOUR SEASONS	Vineyards Elementary School*+	0.25 hour
3	GOLDEN GATE CITY	Big Cypress Elementary School*+	0.25 hour
3	GOLDEN GATE ESTATES	Big Cypress Elementary School*+	0.5 hour
3	FLORIDA SPORTS PARK	Lely Elementary School***	0.5 hour
		Golden Gate Shelters**	0.5 hour
3	BIG CYPRESS	Immokalee Shelters	1.0 hour
4/5	CORKSCREW	Corkscrew Middle School	0.25 hour
4/5	QUAIL CREEK/ORANGE TREE	Corkscrew Middle School	0.25 hour
4/5	GOLDEN GATE ESTATES	Corkscrew Middle School	0.5 hour
		Immokalee Shelters	1.0 hour
4/5	FAKAHATCHEE	Immokalee Shelters	1.0 hour
ALL	SPECIAL NEEDS PRIMARY	Barron Collier High School***	1.0 hour
ALL	SPECIAL NEEDS SECONDARY	Gulf Coast High School*+	1.0 hour

TABLE 2.24-45			
SHELTER DESIGNATIONS AND OPTIONS			
			ESTIMATED
CATEGORY	EVACUATION ZONE	SHELTER NAME	TRAVEL TIME
ALL	TOTAL EVACUATION	All Zones	1.0 hour
**	Closes in a Category 2 Hurricane.		
***	Closes in a Category 3 Hurricane.		
*+	Closes in a Category 4/5 Hurricane.		

As can be seen from Table 2.24-43, some routes end up being ultimate constricting points for more than one zone. That being the case, it may be expected that these times will become cumulative. This creates a "greatest time to clear" for the County as a whole. Table 2.24-45 depicts the greatest time to clear calculation for each category storm. As with previous updates, the Marco Island Bridge has the lowest capacity of the SR 951 (Collier Blvd.) roadway segment. This fact associated with a large vulnerable population creates the highest evacuation time in the County. However, this time is expected to be reduced by 55 to 62 percent with an additional bridge span being constructed, which more than doubles the capacity of the Marco Island Bridge.

TABLE 2.24-46

2001 ULTIMATE CONSTRICTING ROUTES, LANDFALLING STORM

		CLEARANCE TIME					
		JULY			OCTOBER		
STORM	CONSTRICTING		INTER-			INTER-	
CATEGORY	ROUTES	SLOW	MEDIATE	QUICK	SLOW	MEDIATE	QUICK
1	SR 951& SR 92, CR 951, U.S. 41	14.3	11.8	11.0	16.9	14.0	13.1
1	(SR 951One-Way), SR 92, CR 951, U.S. 41	10.3	9.4	9.1	12.3	11.3	10.9
1	(SR 951& SR 92 One-Way), CR 951, U.S. 41	8.5	8.2	8.0	10.2	9.8	9.6
2	SR 951& SR 92, CR 951, U.S. 41	20.4	17.2	16.2	24.0	20.3	19.1
2	(SR 951One-Way), SR 92, CR 951, U.S. 41	16.4	14.9	14.3	19.4	17.6	16.9
2	(SR 951& SR 92 One-Way), CR 951, U.S. 41	14.6	13.6	13.2	17.3	16.1	15.7
3 & 4/5	SR 951& SR 92, CR 951, U.S. 41	23.9	19.2	17.7	28.3	22.7	21.0
3 & 4/5	(SR 951One-Way), SR 92, CR 951, U.S. 41	19.9	16.8	15.8	23.6	20.0	18.8
3 & 4/5	(SR 951& SR 92 One-Way), CR 951, U.S. 41	18.1	15.6	14.8	21.6	18.5	17.5

	Denotes traffic management option, in order to reduce time.

Clearly, route constriction becomes a concern when it is unevenly distributed between different parts of the County. The relative isolation of the shoreline south of Naples and the limted routes south of SR 84 (Alligator Alley) limits evacuation capacity causing the large evacuation times. The possibility exists that the increased traffic control can better distribute loadings.

Normally, if exiting routes create the highest evacuation times for the County, it is because there are not enough evacuation shelters available to keep the evacuees within the County. Table 2.24-47 depicts the times that may occur, given different routes.

Table 2.24-47

2001 COLLIER COUNTY EXITING ROUTES: LANDFALLING STORM

STORM CATEGORY	TOTAL VEHICLES LEAVING CO.	ROUTES	COMBINED CAPACITIES			CLEARANCE TIMES JULY/OCT.		
			SLOW	INTER-MEDIATE	QUICK	SLOW	INTER-MEDIATE	QUICK
1(A) J	40,762	I-75(N), US 41(N),	7,775	8,273	8,484	5.2	4.9	4.8
J(a)	32,994	SR 29 & CR 846				4.2	4.0	3.9
O	54,135					7.0	6.5	6.4
O(a)	46,366					6.0	5.6	5.5
2(A) J	94,050	I-75(N), US 41(N),	7,775	8,273	8,484	12.1	11.4	11.1
J(a)	90,791	SR 29 & CR 846				11.7	11.0	10.7
O	115,532					14.9	14.0	13.6
O(a)	112,273					14.4	13.6	13.2
2(B) J	94,050	I-75(N&E), US 41 (N),	10,995	11,493	11,704	8.6	8.2	8.0
J(a)	90,791	SR 29 & CR 846				8.3	7.9	7.8
O	115,532					10.5	10.1	9.9
O(a)	112,273					10.2	9.8	9.6
3(A) J	144,172	I-75(N), US 41(N),	7,775	8,273	8,484	18.5	17.4	17.0
J(a)	142,428	SR 29 & CR 846				18.3	17.2	16.8
O	171,229					22.0	20.7	20.2
O(a)	169,485					21.8	20.5	20.0
J*	141,215					18.2	17.1	16.6
J(a)*	137,956					17.7	16.7	16.3
O*	168,272					21.6	20.3	19.8
O(a)*	165,013					21.2	19.9	19.5
3(B) J	144,172	I-75(N&E), US 41(N)	10,995	11,493	11,704	13.1	12.5	12.3
J(a)	142,428	SR 29, & CR846				13.0	12.4	12.2
O	171,229					15.6	14.9	14.6
O(a)	169,485					15.4	14.7	14.5
J*	141,215					12.8	12.3	12.1
J(a)*	137,956					12.5	12.0	11.8
O*	168,272					15.3	14.6	14.4

Table 2.24-47

2001 COLLIER COUNTY EXITING ROUTES: LANDFALLING STORM

STORM CATEGORY	TOTAL VEHICLES LEAVING CO.	ROUTES	COMBINED CAPACITIES			CLEARANCE TIMES JULY/OCT.		
			SLOW	INTER-MEDIATE	QUICK	SLOW	INTER-MEDIATE	QUICK
O(a)*	165,013					15.0	14.4	14.1
3(C) J	144,172	I-75 (N&E), US 41 (N&E),	12,075	12,839	13,162	11.9	11.2	11.0
J(a)	142,428	SR 29 & CR 846				11.8	11.1	10.8
O	171,229					14.2	13.3	13.0
O(a)	169,485					14.0	13.2	12.9
J*	141,215					11.7	11.0	10.7
J(a)*	137,956					11.4	10.7	10.5
O*	168,272					13.9	13.1	12.8
O(a)*	165,013					13.7	12.9	12.5
3(D) J	144,172	I-75 (N), I-75 (E-one way),	15,295	16,059	16,382	9.4	9.0	8.8
J(a)	142,428	US 41 (N&E), SR 29 & CR 846				9.3	8.9	8.7
O	171,229					11.2	10.7	10.5
O(a)	169,485					11.1	10.6	10.3
J*	141,215					9.2	8.8	8.6
J(a)*	137,956					9.0	8.6	8.4
O*	168,272					11.0	10.5	10.3
O(a)*	165,013					10.8	10.3	10.1
4/5(A) J**	156,520	I-75 (N), US 41(N),	7,775	8,273	8,484	20.1	18.9	18.4
O**	184,621	SR 29 & CR 846				23.7	22.3	21.8
J(a)**	154,775					19.9	18.7	18.2
O(a)**	182,877					23.5	22.1	21.6
4/5(B) J	156,520	I-75 (N&E), US 41(N)	10,995	11,493	11,704	14.2	13.6	13.4
O	184,621	SR 29, & CR846				16.8	16.1	15.8
J(a)**	154,775					14.1	13.5	13.2
O(a)**	182,877					16.6	15.9	15.6
4/5(C) J	156,520	I-75 (N&E), US 41 (N&E),	12,075	12,839	13,162	13.0	12.2	11.9
O	184,621	SR 29 & CR 846				15.3	14.4	14.0
J(a)**	154,775					12.8	12.1	11.8
O(a)**	182,877					15.1	14.2	13.9
4/5(D) J	156,520	I-75 (N), I-75 (E-one way),	15,295	16,059	16,382	10.2	9.7	9.6
O	184,621	US 41 (N&E), SR 29 & CR 846				12.1	11.5	11.3

Table 2.24-47

2001 COLLIER COUNTY EXITING ROUTES: LANDFALLING STORM

STORM CATEGORY	TOTAL VEHICLES LEAVING CO.	ROUTES	COMBINED CAPACITIES			CLEARANCE TIMES JULY/OCT.		
			SLOW	INTER-MEDIATE	QUICK	SLOW	INTER-MEDIATE	QUICK
J(a)**	154,775					10.1	9.6	9.4
O(a)**	182,877					12.0	11.4	11.2

J = July O = October

(a) Assumes secondary refuges are open.

*Assumes refuges in the category 2 zone remain open.

**Assumes refuges in the category 3 zone remain open.

The last factor to be incorporated into calculating the County clearance time is the response of the potential evacuees to an evacuation order. The original 1981-82 Regional Hurricane Evacuation Plan discussed this topic and ultimately concluded that seven hours would be the minimum time needed to clear a zone, because some evacuees would procrastinate more than others.

More recent history indicates that sudden or dramatic changes in hurricanes can heighten the evacuee's response into quick evacuation, limited basically by road capacity. Consequently, in evaluating the final criteria that determine a slow, intermediate, or quick evacuation. Both slow and intermediate zone will have minimum response time of seven hours, whereas a "quick evacuation" will be limited only by roadway capacity. All of these factors combine to create a countywide clearance time. This time will vary depending upon the routes available for out of County evacuation, the time of season, and whether it is a slow, intermediate, or quick response. Table 2.24-48 summarizes the total evacuation time, which is the sum of the greatest clearance time and the greatest travel time to either the nearest shelter or travel time out of the County. The clearance time for the County as a whole for Category 3 storm will increase if traffic control measures such as one-waying the S.R. 951 Bridge and S.R. 92 are not implemented and out-of-county evacuation is limited solely to I-75 north, U.S. 41, CR 846 and S.R. 29. Obviously, if more routes are provided, the time may lessen. This, of course depends upon the impact of other counties evacuating because of the impending storm.

TABLE 2.24-48

2001 TOTAL EVACUATION TIME LANDFALLING STORM

		CLEARANCE TIME (2)						**TOTAL EVACUATION TIME**					
				INTER-						INTER-			
STORM		SLOW		MEDIATE		QUICK		SLOW		MEDIATE		QUICK	
CATEGORY	DESTINATION (1)	J	O	J	O	J	O	J	O	J	O	J	O
1	1.0	14.3	16.9	11.8	14.0	11.0	13.1	15.3	17.9	12.8	15.0	12.0	14.1
1(A)	1.0	10.3	12.3	9.4	11.3	9.1	10.9	11.3	13.3	10.4	12.3	10.1	11.9
1(B)	1.0	8.5	10.2	8.2	9.8	8.0	9.6	9.5	11.2	9.2	10.8	9.0	10.6
2	1.0	20.4	24.0	17.2	20.3	16.2	19.1	21.4	25.0	18.2	21.3	17.2	20.1
2(A)	1.0	16.4	19.4	14.9	17.6	14.3	16.9	17.4	20.4	15.9	18.6	15.3	17.9
2(B)	1.0	14.6	17.3	13.6	16.1	13.2	15.7	15.6	18.3	14.6	17.1	14.2	16.7
3 & 4/5	1.0	23.9	28.3	19.2	22.7	17.7	21.0	24.9	29.3	20.2	23.7	18.7	22.0
3 & 4/5(A)	1.0	19.9	23.6	16.8	20.0	15.8	18.8	20.9	24.6	17.8	21.0	16.8	19.8
3 & 4/5(B)	1.0	18.1	21.6	15.6	18.5	14.8	17.5	19.1	22.6	16.6	19.5	15.8	18.5
3*	0	18.5	22.0	17.4	20.7	17.0	20.2	18.5	22.0	17.4	20.7	17.0	20.2
4/5*	0	20.1	23.7	18.9	22.3	18.4	21.8	20.1	23.7	18.9	22.3	18.4	21.8

(1) From Table 9 or 10, whichever is greater

(2) From Table 11 or 12, determined by whichever is greater.

= Denotes traffic management option, in order to reduce time.

(A) SR 951 (One-Way Bridge) & SR 92

(B) SR 951 (One-Way Bridge) & SR 92 One-Way

*Assumes use of I-75 N, US 41 N, SR 29 and CR 846 (Immokalee Rd.) as exiting routes

D. Objective Achievement Analysis – please refer to section B

E. Conclusion

Collier County has made considerable progress in the past seven years in dealing with the following issues: maintenance of clearance times and adequate shelter space

Maintenance of Clearance Times

Evacuation times have actually decreased in spite of the marginal increase in population size and increased traffic, primarily due a number of roadway projects.

Adequate Shelter Space

The County has provided adequate shelter space for its population up to a Category 1 hurricane.

The County will continue to enforce its existing land use regulations for land use intensities/densities within the CHHA to curtail the current deficit of shelter space for a Category 2 or greater hurricane and the maintenance or reduction of clearance times in the future.

F. Specific Policy Relevance:

The majority of the enabling policies continue to be relevant to and will be retained.

Recommendations:

In order to continue to strive to make progress in maintaining or decreasing evacuation clearance times and reducing the deficit of emergency shelter space, Collier County should consider doing the following:

- Create a "Special Populations at Risk" Overlay that will prohibit the construction of nursing/convalescent centers and hospitals within the County's designated CHHA that are not located within "close" proximity to designated hurricane corridor/arterial roadways.

- Within the CHHA, the identification of designated hurricane evacuation roadway segments/constrictions points that are at a level service D or worse with the implementation of building construction program to build hurricane evacuation shelters.

- Adding hurricane evacuation shelters as a new Category A on the Public Facilities list

- The County shall create an interlocal agreement for all adjacent, incorporated governments that are within the CHHA, that being Everglades City, City of Marco Island, and the City of Naples, in regards to the approval process for large-scale developments that will impose direct, negative impacts on the LOS of roadways/hurricane evacuation corridors in Collier County.