



# Volume 1-8 Tampa Bay Region Technical Data Report

## CHAPTER III

### REGIONAL BEHAVIORAL ANALYSES SUMMARY



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# CHAPTER III

## REGIONAL BEHAVIORAL ANALYSIS SUMMARY

### A. Background

For planners and emergency managers, one of the most elusive components of evacuation planning is anticipation of the behavior of our population. The behavioral analysis is one of the most important tasks in preparing hurricane evacuation plans. It includes the development of the necessary assumptions regarding the manner in which evacuees in and around the threatened area will react to the hurricane threat. Behavioral assumptions based on professional analysis of survey results are the final output of the behavioral component of this study. These assumptions regarding human behavior in an emergency situation become a critical tool in shelter planning, transportation modeling, and evacuation decision-making and public information efforts.



The public responses having the greatest impact upon an evacuation are listed below. These tendencies and choices of potential evacuees must be quantified in the behavioral analysis:

1. **Evacuation Rates** - The percentage of population in evacuated and non-evacuated areas that will evacuate during a threat;
2. **Evacuation Timing** - When the evacuation population would leave their residences in response to a hurricane warning, watch, a given evacuation order or recommendation, and landfall;
3. **Vehicle Use** - The number of vehicles that evacuating households would use for evacuation;
4. **Type of Refuge** - The percentage of evacuees that will seek public shelter and other types of refuge such as the homes of friends and relatives, motel/hotels and other locations such as churches, workplaces, and second homes;
5. **Evacuation Destinations** - The location an evacuee travels to in the event of an evacuation. These destinations can include public shelters, homes of friends/relatives, hotels/motels, and destinations out of the region;
6. **Response by Vacationers** - The evacuation response by vacationers, including R.V. park visitors, encompassing evacuation rate, timing, public shelter use, and vehicle use.

Final behavioral assumptions for each county in the region are included near the end of this summary. Further discussion and a detailed explanation of the analysis used to derive primary behavioral assumptions are included in Volume 2 of the Regional Evacuation Study.

## B. Methodology

### 1. Survey Methodology

To begin the behavioral analysis for the Statewide Regional Evacuation Study (SRES) Program, new behavioral data was compiled from telephone responses to a survey instrument developed for the study by each regional planning council with input from local emergency managers. The wording of survey questions was further refined by Dr. Earl J. Baker of Hazards Management Group, Inc. Kerr-Downs Research, Inc. administered the survey instrument via telephone interviews and assembled the results for each region as Volume 3 of the Statewide Regional Evacuation Study. Volume 3 constitutes a compiled and complete listing of survey results and regional findings from the unprecedented 2007-2008 survey of Florida residents. Further analysis and planning assumptions were developed from the survey results by Hazards Management Group.

The primary aim of the survey was to provide data to assist in deriving evacuation related behavioral assumptions for transportation and shelter analyses. The main focus of the survey was hurricane evacuation, but questions were also asked about evacuation due to freshwater flooding, wildfires, and hazardous material accidents. The survey instrument included questions that are important in developing accurate behavioral assumptions for transportation and shelter planning. These included questions asked of all Florida survey participants, but also incorporated questions deemed useful by the regional planning council and county emergency management officials. Meetings were held with county and regional planning council staff to discuss the questionnaire and related survey issues.

In each coastal county of the state 400 interviews were conducted. The interviews were allocated between risk areas and non-surge areas) in the respective counties. The aggregation of evacuation zones and allocations of interviews among the evacuation zones were determined after input from county and regional representatives and varied among counties and regions. Respondents to the survey were also selected in order to reflect aggregations of evacuation zones currently used operationally and in public information materials by counties and to provide appropriate distributions of data that would be necessary to derive behavioral projections as required by the Statewide Regional Evacuation Study. In order to ensure that respondents resided in the evacuation zones of interest, addresses were selected first and then matched with telephone numbers. Only residences with land-line telephones were called, as sampling was conducted by address.

Note: In each non-coastal county of the state, 150 interviews were conducted randomly by telephone. An overview of the survey sample and aggregation of responses is included below in Table III-1.

**Table III-1:  
Sample Sizes for Counties in the Tampa Bay Region**

	Site-built Homes	Mobile Homes	Total Homes
Hillsborough Cat 1	91	8	99
Hillsborough Cat 2-3	93	7	100
Hillsborough Cat 4-5	90	6	99
Hillsborough Non-surge	93	6	99
Manatee Cat 1	86	17	100
Manatee Cat 2-3	83	17	100
Manatee Cat 4	86	14	100
Manatee Non-surge	82	18	98
Pasco Cat 1	88	10	98
Pasco Cat 2-3	86	13	99
Pasco Cat 4-5	94	6	100
Pasco Non-surge	64	36	100
Pinellas Cat 1	92	8	100
Pinellas Cat 2-3	83	16	99
Pinellas Cat 4-5	85	12	97
Pinellas Non-surge	91	8	99
TOTAL	1,387	201	1,588

For hazards other than hurricanes, sample sizes are smaller. In the Tampa Bay Region, one-third of the respondents were asked about freshwater flooding or wildfires or hazardous material accidents. (In counties within the emergency planning zone for a nuclear power plant, one-fourth of the respondents were asked about one of the previously listed hazards or about nuclear power plants.)

#### **a. Storm Events**

As stated previously, the behavioral survey for the Statewide Regional Evacuation Studies focused on the storm events of 2004 - 2005. Due to the varied impact areas from the storm events, each of the 11 regional planning councils identified the appropriate storm events on which the survey for their region would be based. Surveys in the Tampa Bay Region focused on experiences gained from the 2004 Hurricanes Charley, Frances and Jeanne.

The first, Hurricane Charley, was a fast-moving category 4 storm that was originally forecast to make a direct hit in Tampa Bay and initiated a Level D Evacuation in the region on Friday August 13, 2004. As the storm entered the Gulf of Mexico it veered slightly east hitting the coastline in Charlotte County on Saturday exiting the east coast near Daytona Beach at 11:00 p.m. The eye of this storm was small, which created a relatively narrow swath of severe wind damage along the track.

The second storm event, Hurricane Frances, took a more direct path along the northern Caribbean Islands and came ashore in Stuart, Florida, as a category 2 hurricane. Evacuation orders were issued for mobile home residents and recommendations were issued for low lying areas in all four counties. As the hurricane exited the state,

hurricane-force winds from Frances affected only the northern parts of the Tampa Bay Region.

The third hurricane of the 2004 season to affect the region was Hurricane Jeanne, making landfall in Stuart as a category 3. Jeanne and Frances followed similar paths across the state. Impacts to the Tampa Bay Region were similar although Jeanne was slightly stronger and moved faster. Again, evacuation orders/recommendations were issued for low-lying areas and mobile home residents in all four counties in the region.

## **b. Regional Characteristics**

In Chapter I, the Population and Demographics of the Tampa Bay Region was discussed. It is recognized that the region faces many challenges in evacuation as a result of our specific demographic profile. The region has a large densely populated coastal along the barrier island chain in Manatee and Pinellas Counties. The bay could funnel additional storm surge along the densely populated coastlines of Pinellas and Hillsborough Counties as well as affecting the downtown areas of Tampa and St. Petersburg. Our population is older and therefore, it is anticipated that there will increased demand for special needs shelters and health care support. There is a large mobile home population which will have a significant effect on the evacuation and the shelter operations.

## **2. Deriving Behavioral Assumptions**

Since each evacuation scenario is different and entirely unique, behavioral analysis for evacuation is predictive. The final products of behavioral analyses are basic assumptions that form the best available predictive information regarding likely human behavior. Regardless of how detailed, formal, or quantitative an evacuation plan appears, it contains assumptions about behaviors such as those discussed throughout this study. Every time a clearance time is calculated to determine the length of time required to complete an evacuation under a defined scenario, the model simulations include quantitative assumptions regarding behavioral factors. Behavioral assumptions are also employed in an effort to predict the needed capacity of shelters to house an unknown number of residents that will evacuate to a public shelter. Behavioral assumptions will change over time based on the level of public education regarding evacuation or the level of evacuation experience of a population. The issue is not whether such assumptions are or should be made; but what the assumptions should be.

There is no simple one-rule-fits-all technique for deriving behavioral assumptions for planning. The best solution is to employ the best available mix of indicators, relying most heavily on the best information available for each behavior and scenario in question.

A detailed listing and discussion of behavioral assumptions is included in Volume II of this Statewide Regional Evacuation Study series. However, a few of the most fundamental and critical assumptions are included at the end of this summary.

## C. Key Survey Findings for the Tampa Bay Region

### 1. Information and Awareness

Over four out of five Tampa Bay region residents (81%) have access to the Internet. One in three of these individuals (32%) claims to have visited their county’s website to search for information about hurricanes – this translates to 26% of all residents in the region. Over four out of five residents (83%) in the Tampa Bay region maintain they have seen a map of their county showing areas that need to evacuate in case of hurricanes.

One in three residents (33%) of the coastal counties in the Tampa Bay region believes they live in a surge evacuation zone. Knowledge about one’s evacuation zone is limited as shown below:

**Table III-2  
Awareness of Evacuation Zones**

Evacuation Zone	Know Evacuation Zone in Which One Lives
Category 1	47%
Category 2	33%
Category 3	42%
Category 4	16%
Category 5	23%

This finding indicates a lack of knowledge or understanding of risk, the relationship of storm surge and evacuation zones and illustrates the need for more effective public information.

### 2. Evacuation Intent

Percentages of citizens who say they will follow mandatory evacuation notices vary depending on the strength of the storm. It makes sense that compliance with orders for evacuation increases linearly as hurricanes strengthen from category 1 or 2 to 3 to 5. (It should be noted that historically, respondents’ intent to evacuate is consistently higher than actual evacuation rates.

**Table III-3  
The Percentages of All Households That Evacuated and the Most Popular Types of Destinations**

Storm	Evacuated	Neighborhood	County	Elsewhere in Florida	Outside Florida
Charley	27%	4%	10%	12%	1%
Frances	13%	3%	4%	5%	1%
Jeanne	10%	2%	5%	4%	1%

Hurricanes Frances and Jeanne impacted the Tampa Bay Region as low intensity exiting storms. Hurricane Charley made landfall 100 miles further south than predicted before most evacuees had evacuated. Therefore, the evacuation participation rates are lower than expected. The Tampa Bay Region has not been impacted by a major storm since 1921.

Significant percentages of residents say they intend to evacuate their homes even when the evacuation notice does not apply directly to them. The term “shadow evacuation” applies to those residents of site built homes who live outside of the storm surge evacuation zones and evacuate without having been ordered.

**Table III-4  
Residents That Say They Intend to Evacuate Their Homes Even When the Evacuation Notice Does Not Apply Directly to Them**

<b>Evacuation Zone</b>	<b>Evacuation Notice for Zones 1 and 2</b>	<b>Evacuation Notice for Zones 1,2 and 3</b>	<b>Evacuation Notice for Zones 1,2,3,4 and 5</b>
Category 1	-	-	-
Category 2	58%	74%	95%
Category 3	70%	78%	93%
Category 4	51%	70%	91%
Category 5	50%	63%	91%
Non-Surge	49%	58%	75%

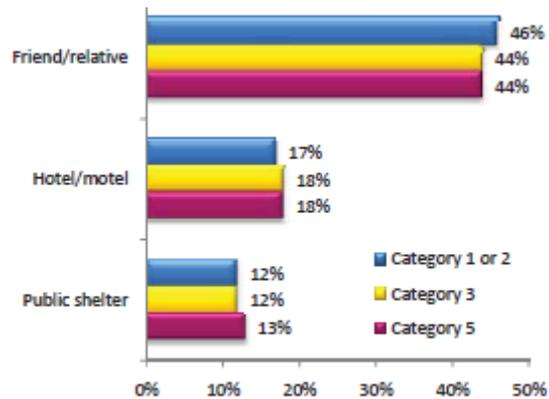
The table above reveals that non-surge vulnerable inland evacuees could represent a significant proportion of the overall evacuation population and will contribute to potential evacuation route congestion, fuel shortages and shelter demand.

**3. Evacuation Destination**

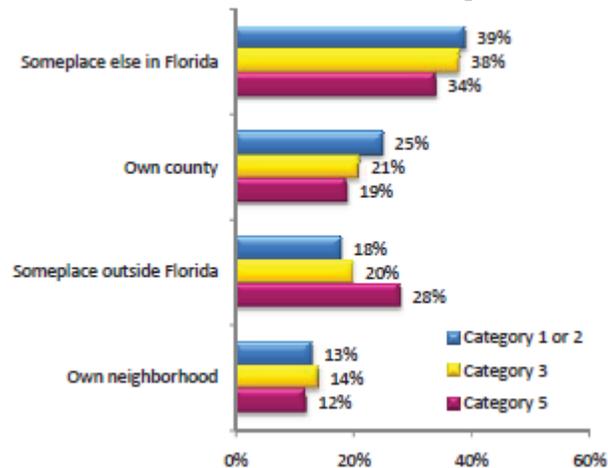
Regardless of the hurricane strength, most residents of the Tampa Bay Region intend to go to friends or relatives if they evacuate. Behavioral survey results indicated that approximately 45% of evacuees intend to find safety in the households of friends and family. Approximately 18% of respondents indicated they would seek hotel/motel accommodations and 12-13% indicated they would seek public shelter. Minor changes in evacuation destinations occur as hurricanes strengthen in the hypothetical scenarios.

Most residents intend to evacuate to other places in Florida regardless of hurricane strength. Almost two-thirds of the residents in site-built homes in coastal counties said they would go out of county when evacuating, compared to half of those in non-coastal counties although most would remain in the region. Fewer mobile home evacuees said they would go out of county. The percentages of residents who intend to evacuate outside Florida increase as hurricanes strengthen to category 5. Most residents who intend to evacuate outside Florida will go to Georgia. Specific information regarding evacuation destinations are shown in the following two figures.

**Figure III-1  
Evacuation Destinations by Type**



**Figure III-2  
Evacuation Destinations by Location**



**4. Obstacles to Evacuation**

In order to determine why residents who are ordered to evacuate indicate that they will not, questions designed to identify any potential obstacles to evacuation were posed.

Six percent of households include an individual who requires assistance during evacuation. Over half of these households have an individual who is disabled, has a medical condition or requires some other type of special assistance beyond transportation assistance. Twenty-five percent of these households (2% of all households) will require assistance from an outside agency. Only one in five (19%) of the (2%) households that require special assistance have registered with their county as needing special assistance.

Percentages of households in the Tampa Bay region that require transportation during evacuation vary only slightly from a low of 1% in Pinellas County to a high of 3% in Hillsborough, Manatee and Pasco Counties.

Approximately one in ten households (12%) claim there are obstacles beyond transportation and disabilities/medical needs that create obstacles to evacuating. In those households, pets (42%), traffic (23%), and road obstructions (12%) are cited as the most critical obstacles to evacuation other than lack of transportation or medical/special needs. Residents living in evacuation zones 2 and 5 are more likely to think traffic will be a problem.

Pinellas (15%) and Manatee County (14%) residents are more likely to think obstacles other than transportation and medical/special needs may keep them from evacuating. Pets are listed more often by Hillsborough (53%) and Pasco (53%) residents, while Manatee County residents (31%) are more likely to list traffic as an impediment to evacuation. Only 6% of households in the Tampa Bay region include one or more individuals who will require assistance in the event of an evacuation. This percentage is highest within households in evacuation zone 4 (11%).

Over half of residents (53%) in the Tampa Bay region have pets: 89% of these residents plan to take their pets with them if they evacuate. Most residents with pets (93%) are aware that public shelters will not accept pets inside, and 9% of these residents claim they will not evacuate because of this.

Only 25% of Tampa Bay households that need hurricane assistance during hurricane evacuation (2% of all households in the region) need an outside agency to lend transportation or medical assistance. Most households that need assistance during evacuation will either provide that assistance within their household (37%) or depend on a friend or relative (28%) to provide this assistance. Sample sizes within evacuation zones and within counties are fairly small and should be interpreted with caution.

**Table III-5  
Household Members Need Assistance to Evacuate**

<b>Evacuation Zone</b>	<b>Number</b>	<b>Yes</b>	<b>No</b>	<b>Not Sure</b>
Tampa Bay Region	1600	6%	93%	1%
Category 1	400	6%	93%	1%
Category 2	200	7%	92%	1%
Category 3	200	6%	92%	1%
Category 4	213	11%	88%	1%
Category 5	187	7%	92%	1%
Non-Surge	400	4%	96%	1%
Inland	300	15%	84%	1%

## 5. Evacuation Scenarios

Evacuation behavior can be affected by a variety of external factors as illustrated throughout the behavioral survey results. Several of the most significant factors and likely behavioral responses are discussed in this section.

## a. Storm Characteristics

### (1). Storm Severity

The 2007-2008 behavioral survey results for the Tampa Bay Region consistently show a marked difference in responses associated with hypothetical severe storms (Category 4 and Category 5). Storm severity also plays a significant role in evacuation destination especially with regard to out-of-county travel. Conclusions derived from Hurricanes Charley, Frances and Jeanne participation rates cannot accurately predict the evacuation scenario for a large, highly destructive major storm. In Florida, evacuation during Hurricane Floyd is one of the best examples of multi-regional, multi-state evacuation caused by a large hurricane. The setting for Hurricane Floyd in 1999 should be taken into account when attempting to understand the reaction of the populous. Floyd was a strong category 4 storm that had moved on a path directly toward South Florida for several days. The storm was ominous, but forecasters guardedly predicted that Floyd would veer off into the Atlantic and miss Florida. The storm continued to advance with huge press coverage and did not turn until finally, at the last safe distance, the storm altered its course and skirted the State. Floyd did, however, landfall in North Carolina as a category 2 storm, causing major damage along the Eastern Seaboard and initiating what Time Magazine described as the largest evacuation in history. The point here is to give an idea of how public response can be affected by an extreme storm.

Evacuation rates in non-coastal counties during Floyd ranged from 12% in the East Central Florida region to 49% in the Charleston, SC region. The average non-coastal county evacuation rate for all 11 regions studied was about 24%. Keep in mind that Floyd was a major storm and every storm is different. However, because of the scale of the Floyd evacuation, the chance of reoccurrence must be recognized. Results for coastal and non-coastal county evacuation need to be continually evaluated and validated by behavioral studies from other storms.

In sum, the Hurricane Floyd Assessment clearly showed that, in a major storm, people will get in their car and leave their home county. In fact, the 7,000 surveys from the Hurricane Floyd Assessment inferred that 75% of the nearly 3 million evacuees left their county. As stated throughout this study, every storm presents a unique and different scenario. However, storm severity has consistently been shown to be a significant factor in making the decision to evacuate. Multi-region clearance times are provided in Volume 4 - Transportation Analysis.

### (2). Landfalling, Paralleling, and Exiting Storm Paths

Storm path can have a significant effect on any evacuation scenario especially with respect to out-of-county evacuation destinations. A comparison of these three storm path scenarios serves as a reminder that every storm is different. Therefore, studies such as this one cannot predict operational decision making. However, a general discussion of potential scenarios can provide useful information to emergency managers for decision making.

- (a). Landfalling storms are storms that impact the coastline directly. Generally, landfalling storms precipitate the highest surge values and most destructive winds. With regard to evacuation, landfalling storms allow for more alternative evacuation destinations. For example, a storm landfalling in the Withlacoochee region would allow for evacuating populations to find safe destinations to the north or south of the storm path.
  - (b). Paralleling storms, like the name suggests, typically travel along the coastline. On the Gulf Coast of Florida paralleling storms are potentially more destructive than on the Atlantic coast due to the counterclockwise spin of a tropical cyclone. Evacuation patterns are typically to the north and away from the storm path.
  - (c). Exiting storms, as the name also suggests are storms that have made landfall and, after having travelled across land, are heading back to sea. In Florida, that typically means across the peninsula. Relative surge values and wind speeds are typically lower for exiting storms. However, Hurricanes Frances and Jeanne in 2004 demonstrated that evacuation of vulnerable areas during an exiting storm is often warranted due to the unpredictable nature of storm events. Each of the three storms created a different scenario with unique characteristics. Therefore, operational decisions cannot be made in advance. Discussion of storm scenarios only provides a theoretical frame of reference.
- (3). Evacuation Timing**

The timeframe in which people respond to an evacuation order varies. The terms long response and short response refer to the time it takes for evacuees to mobilize following an evacuation notice. Evacuation studies typically express the temporal nature of evacuation response in a “response curve” that is derived from response curves documented in actual evacuation. Traffic modelers, in turn, load the response curve into the model to calculate evacuating traffic counts and predict potentials for traffic congestion during a future evacuation event.

The most significant factor affecting a long or short response is the urgency of the evacuation order. Response curves are also affected by the media. If a storm changes course unexpectedly or intensifies it usually becomes necessary to hasten evacuation. Urgency is sometimes inherent due to the relatively inaccurate science of hurricane forecasting.

#### **b. Phased Evacuation**

In urban areas or in areas with large at-risk populations, phased evacuation is an operational tool to allow for a more orderly evacuation. In this scenario, specific areas are given a time window in which to evacuate based on the capacity of the roadway to accommodate the expected flow. This also allow more vulnerable populations to clear bridges and causeways before mainland evacuations are ordered. Phased evacuation is commonly used in the Florida Keys due to the

roadway characteristics that link this densely populated string of islands. The effectiveness of phased evacuation relies on accurate behavioral assumptions.

### c. Reverse Lane Flow

Reverse lane flow is an evacuation scenario where authorities change the direction of highway lanes to direct all lanes to flow in the same direction. The purpose is to hasten the evacuation of people during a major disaster. When a major hurricane is expected to make landfall, the Highway Patrol will implement reverse lane flow upon an Executive Order from the Governor.

Currently, only a few highway segments are designated for potential reverse lane flow operations in the state:

- I-10 West from Jacksonville;
- I-4 East from Tampa;
- I-75 North from Tampa;
- State Road 528 West out of Brevard County;
- Florida Turnpike North from Ft. Pierce;
- Alligator Alley (I-75) West from Ft. Lauderdale;
- Alligator Alley (I-75) East from Naples;
- and the new I-75 Shoulder Plan in Charlotte County.

The listed highway segments relate to the likely evacuation routes that a significant number of residents living in Florida's largest metropolitan areas would travel in an evacuation scenario.

In situations where evacuation timing is critical and a few additional hours are needed for evacuation, reverse lane flow will speed up the evacuation of residents and tourists. However, reverse lane flow operations are counter-intuitive to the driving public and are only proposed to be implemented during daylight hours. Substantial numbers of public safety man hours are needed to implement the traffic redirection at each interchange. Yet for all the preparation and man-hour resources needed for implementation, modeling efforts predict only a 33% increase in roadway capacity. Therefore, the applicability of reverse lane flow is limited to specific scenarios where the Governor recognizes the urgency for a temporary increase in evacuation route capacity.

## 6. Evacuation Behavior for Other Hazards

The behavioral survey administered for the Statewide Regional Evacuation Study Program included several questions regarding other disasters that may precipitate evacuation orders. Survey respondents were asked questions about their awareness of vulnerability and willingness to follow evacuation orders if issued. The following behavioral information is gathered from Volume 3 - Behavioral Survey Report.

Survey findings included here regarding other evacuation related hazards represent an initial investigation into potential behaviors associated with the hazards examined below. These findings have not been validated through comparison and correlation with similar studies.

Therefore, these findings should be considered a starting point for future investigations and analysis.

#### **a. Wildfire**

The following questions were part of the survey. Responses and further discussion are below the question

**(1). Do you believe that your home might ever be threatened by a wildfire?**

Just one in five residents (22%) in the Tampa Bay region believes that their area may, at some point, be threatened by wildfire. Residents in the rural Pasco County (31%) are much more likely to feel threatened by wildfires, while residents of the densely populated Pinellas County (6%) are considerably less concerned that wildfires may threaten their areas.

**(2). If a wildfire threatened your community and public safety officials ordered you to evacuate, would you?**

Over nine out of ten residents of the Tampa Bay region (93%) claim they intend to evacuate if ordered to do so by public safety officials because of wildfire threats. Intent to evacuate varies somewhat across counties as 96% of Manatee County residents say they intend to evacuate because of wildfires if ordered to do so by public safety officials, while 88% of Pinellas County residents intend to evacuate.

**(3). Where would you go if you evacuated because of a wildfire?**

Approximately one in eight residents (12%) intend to go to a public shelters if there is a need to evacuate because of wildfires. A plurality of residents (43%) intends to evacuate to friends or relatives, while two in ten plans to go to a hotel or motel (19%). Residents in evacuation zone 1 (75%) are more likely to go to friends or relatives (although the sample size is small). Responses to this question vary somewhat across counties. For example, 14% of Pinellas County residents say they intend to evacuate to a public shelter, while fewer Hillsborough County (10%) residents intend to do so. Almost half of Hillsborough County residents (47%) say they will go to friends and relatives, while only 39% of Pinellas County residents will do so.

**(4). Since you've been living in this location, have you ever evacuated your home because of a wildfire?**

Only 1% of residents in the Tampa Bay region say they have experienced a wildfire since living there. The following years were mentioned by at least one Tampa Bay resident when asked in which years wildfire threatened their homes:

- 1992
- 2007

Two residents who answered affirmatively to this question noted that they evacuated to a hotel or motel.

**b. Freshwater Flooding**

Freshwater flooding in the Tampa Bay Region can occur for a variety of reasons including riverine flooding and seasonal flooding from rainfall events and dam (gate) failures. Please refer to the Hazards Analysis of this Technical Data Report for specific description of vulnerabilities. The questions below do not refer to any specific flooding scenario or situation.

**(1). Do you believe that your home might ever be threatened by freshwater flooding?**

One in five residents (21%) of the Tampa Bay region say their home might be threatened by freshwater flooding at some point. Residents in evacuation zone 5 (28%) are slightly more likely to make this claim. Residents in Hillsborough and Manatee counties (26%) are more likely to claim their homes might eventually be threatened by freshwater flooding, while only 11% of residents in Pasco County make this claim.

**(2). If freshwater flooding threatened your community and public safety officials ordered you to evacuate, would you?**

Nearly four in five residents in the Tampa Bay region (79%) maintain they will evacuate their homes if ordered to do so by public safety officials because of freshwater flooding. This percentage is higher (85%) in evacuation zone 4. One in five residents in evacuation zones 1 (21%), 2 (22%), and 5 (22%) say they will not leave their homes if ordered to do so in the event of fresh water flooding. Hillsborough County (86%) and Manatee County (83%) residents are more likely to intend to evacuate because of freshwater flooding. Fewer residents of Pasco County (68%) say they will evacuate if ordered to do so because of freshwater flooding.

**(3). Where would you go if you evacuated because of freshwater flooding?**

A plurality of residents (46%) intends to evacuate to friends or relatives if ordered to evacuate by public officials as a result of freshwater flooding. Residents living in evacuation zones 1 through 3 (50% to 61%) are more likely to evacuate to friends and relatives. Over one in ten residents (12%) maintains they will go to public shelters with comparatively more residents in evacuation zones 4 and 5 and in non-surge zones planning to do so. Hillsborough County residents (55%) are more likely to evacuate to friends and relatives.

**(4). Since you've been living in this location, have you ever evacuated your home because of freshwater flooding?**

Few residents of the Tampa Bay region (2%) indicate they have experienced freshwater flooding while living in this area. Residents in evacuation zones 1 and 4 (4%) are more likely to indicate they have lived through freshwater flooding. Variations between counties are slight with 1% of Pasco County residents claiming to have evacuated because of freshwater flooding, while 3% of Hillsborough County and Manatee County residents make this claim. Residents cited the following years when asked in which year freshwater flooding occurred:

- 1980
- 1985
- 1988
- 2001
- 2002
- 2004

Most residents sought shelter with friends and relatives during that event.

**c. Hazardous Materials Spill**

**(1). Do you believe that your home might ever be threatened by a hazardous material accident?**

One in six Tampa Bay region residents (17%) believes they will be threatened by a hazardous material accident. Concern for this type of accident is greater in non-surge zones. Belief of future threats from hazardous material accident is highest in Hillsborough and Manatee counties (22%) and lowest in Pinellas County (10%).

**(2). If a hazardous material accident threatened your community and public safety officials ordered you to evacuate, would you?**

While relatively few residents (17%) believe that they are threatened by a future hazardous material accident, a high percentage (93%) say they intend to evacuate their homes if public safety officials ask them to do so in response to this type of accident. Residents living in all evacuation zones are quite likely to evacuate if told to do so, and all of residents in non-surge zones will evacuate if ordered. Intention to evacuate in response to hazardous material accidents if told to do so by public safety officials peaks in Hillsborough County (96%) and is lowest in Manatee County (91%).

**(3). Where would you go if you evacuated because of a hazardous material accident?**

Only 7% of residents in the Tampa Bay region say they intend to go to a public shelter if they evacuate from a hazardous material accident. A plurality of residents (47%) intends to go to friends or relatives. One in five residents (20%) intends to evacuate to a hotel or motel. Residents living in non-surge zones are more likely to seek safety with friends and relatives (64%) or in public shelters

(18%). Hillsborough County and Pasco County residents (52%) are more likely to go to friends and relatives, while Manatee County residents (25%) are more likely to seek safety at hotels and motels.

**(4). Since you've been living in this location, have you ever evacuated your home because of a hazardous material accident?**

Two residents in the Tampa Bay region said they have experienced a hazardous material accident in the region. The one resident that remembered the year that they evacuated their home because of a hazardous material accident reported that it occurred in 2007.

**(5). Suppose there was a hazardous material accident but public safety officials advised you to close your windows and doors, turn off your air conditioner, and stay indoors rather than trying to evacuate. Would you stay indoors rather than trying to evacuate?**

Eight out of ten residents in the Tampa Bay region (78%) claim they will follow public safety officials' instructions to stay indoors rather than trying to evacuate. Reactions to this question were highest in non-surge zones (100%) and lowest in evacuation zone 4 (63%). Willingness to stay indoors following a hazardous material accident is highest in Manatee County (83%) and lowest in Hillsborough County (74%).

**d. Nuclear Power Plant Incident**

Progress Energy's Crystal River Nuclear Power Plant is located in Citrus County north of the Tampa Bay Region. Although Pasco County is adjacent to the emergency planning zone for the plant, no questions regarding potential evacuation were asked of Tampa Bay residents. Based upon the survey responses in other more vulnerable regions, it is assumed that a very high percentage of residents will evacuate if ordered to do so, if an accident at the Crystal River Nuclear Power Plant threatened the community. Most of the residents in the Tampa Bay Region would go to friends and relatives in the event of a nuclear accident. Few of the region's residents would intend to go to a public shelter.

## **D. Use of Survey Findings**

Responses to individual survey questions alone are not usually good indicators of how residents will respond in actual threats. A mix of the following indicators was used in deriving behavioral assumptions to use in planning:

- Intended responses
- Responses in past threats
- Responses in past threats in other locations
- Factors usually correlated with actual response

### **1. Intended Responses**

Some of the survey questions asked respondents what they would do in certain situations – whether they would evacuate, where they would go, and so forth. Answers to those

questions constitute intended responses and they provide a very straightforward indicator of behavior. Unfortunately, intended responses often do not match actual responses. That is, people often don't do what they said they would do. In some cases there are statistical adjustments to intended responses that result in much closer matches to actual behavior. For example, in most locations actual use of public shelters is only about half the level indicated by intended response surveys.

## **2. Actual Responses**

A number of survey questions asked interviewees how they responded in past hurricane threats. Tampa Bay survey participants were asked about their evacuation behavior in Hurricanes Charley, Frances, and Jeanne. Earlier surveys in the region had provided actual response data about Elena and Georges. Responses in past threats can be good predictors of future response, but only if the past threats are similar to future threats. In the Tampa Bay Region past threats from Hurricanes Georges, Charley, Frances, and Jeanne did not result in evacuation responses as great as threats that could be posed by future storms. Therefore, the evacuation participation rates observed in those storms are not necessarily good indicators of what it is reasonable to plan for in future threats. For other behaviors such as type of refuge and destination, past responses can be compared for consistency from one evacuation to another and can be used as a comparison with intended responses.

## **3. Past Response in Other Locations**

Although all places are different, responses and patterns observed in one set of locations are often good indicators of what can occur elsewhere, when conditions are similar. This is particularly useful when planning for threats for which there is no reliable response data for similar threats for the region. As part of the SRES, twelve different hurricane threats were asked about in one county or another. In addition, public response has been documented in many other hurricane threats both in and out of Florida, some of which are relevant to planning in the Tampa Bay region. For example, in the great majority of evacuations fewer than 15% of evacuees leave on their own, prior to an evacuation notice being issued by public officials. Due to the consistency of that finding, it is reasonable to apply it to the Tampa Bay counties.

## **4. Statistical Predictors**

Data from other hurricane evacuation surveys like those described above have been analyzed statistically to identify factors that have been correlated with evacuation behavior. Certain variables have been found to predict actual response better than others. For example, perceived vulnerability, actual vulnerability (e.g., evacuation zone), housing type, and hearing evacuation orders are all good predictors of whether residents will evacuate. The SRES survey measured perceived vulnerability, evacuation zone, housing type, and expectation of being told to evacuate, and those factors were combined to provide an indication of whether interviewees would evacuate in certain storm threats, from certain locations, and from certain types of housing. Other variables were used to provide an indication of other evacuation behaviors.

## 5. Combining Information

There is no simple one-rule-fits-all technique for using the above information in deriving behavioral assumptions for planning. The best solution is to employ the best available mix of indicators, relying most heavily on the best information available for each behavior and scenario in question, for a particular county and storm threat. When good, reliable actual response information was available for a certain storm threat scenario, it was relied on more than other types of information. When actual response information was lacking, a combination of intended response, trends from other locations, and application of predictor variables was used.

## 6. Sample Size Considerations

SRES survey statistics were derived from the sample described previously (section I.A. above). The sample provides an estimate of values for the population of people from which the sample was drawn. For example, a sample of Pasco County residents was interviewed for the purpose of estimating how the larger population of Pasco County residents would respond to the same questions.

The sampling plan used in the SRES survey was designed to provide statistically useful county-level data, given budgetary constraints. However, sample estimates become less reliable statistically when the responses are disaggregated, as they were in the analyses conducted as part of the SRES. When responses are broken down by evacuation zone within a county and then by housing type, population-level differences among zones and between housing types are not always as large as they might appear in the sample. This is because sampling error increases when sample size decreases. Therefore, differences in the sample might not be large enough to support a conclusion that similar differences exist in the population from which the sample was selected, due to sampling error.

Aggregating results across counties helps overcome zonal and housing disaggregation problems. However, county variations – if they exist – are masked when results are aggregated at the regional level. The analysis looked at survey results at both the county and regional levels, relying on county-level data to the extent that sample sizes justified that level of analysis, but relying more on regional data when county-level sample sizes were too small.

This is especially true for actual response data. Many SRES respondents were not living in their current county when past storm threats occurred, so they were not asked about their response in those storms. If a resident was living in the area at the time but didn't evacuate, that person couldn't be asked where he or she went (e.g., public shelter, out-of-county). Therefore, for certain actual response questions, regional statistics were more meaningful than county statistics.

## E. Planning Assumptions

Specific Planning assumptions for residents are shown in the following tables. Appearing below each set of tables, there is a brief description of the content of the table. For a more in-depth analysis of the planning assumptions, refer to Volume 3, Behavioral Planning Assumptions.

For each county there are 14 tables:

1. Evacuation rate for site-built homes
2. Out-of-county trip rates for site-built homes
3. Percent of available vehicles to be used by site-built homes
4. Public shelter use rates for site-built homes
5. Friend and relative use rates for site-built homes
6. Hotel and motel use rates for site-built homes
7. Other refuge use rates for site-built homes
8. Evacuation rate for site-built homes
9. Out-of-county trip rates for mobile and manufactured homes
10. Percent of available vehicles to be used by mobile and manufactured homes
11. Public shelter use rates for mobile and manufactured homes
12. Friend and relative use rates for mobile and manufactured homes
13. Hotel and motel use rates for mobile and manufactured homes
14. Other refuge use rates for mobile and manufactured homes

In each table for county there are planning assumptions for six evacuation zones:

1. Areas needing to evacuate due to storm surge flooding from category 1 hurricanes
2. Areas needing to evacuate due to storm surge flooding from category 2 hurricanes
3. Areas needing to evacuate due to storm surge flooding from category 3 hurricanes
4. Areas needing to evacuate due to storm surge flooding from category 4 hurricanes
5. Areas needing to evacuate due to storm surge flooding from category 5 hurricanes
6. Areas not needing to evacuate due to storm surge flooding from hurricanes

Zones were defined relative to zones currently used by each county. In instances where counties currently aggregate zones the planning assumptions were interpolated for intermediate zones. For example, if a county used zones 1-2, 3, and 4-5, trends across those zones were used to specify assumptions for zones 1, 2, 3, 4, and 5.

## 1. Evacuation Rates

Evacuation rates refer to the percentage of people who will leave their homes to go someplace safer during a hurricane threat. This is a critical variable for planning because it drives the number of vehicles on the roadways during an evacuation. Responses will vary even for hurricanes of the same intensity, depending on how great the threat appears to be to one's specific location, as well as other factors. Evacuation rates on the periphery of warning areas tend to be lower than in areas closest to the projected path of a threatening storm. A strong category 4 hurricane which has maintained its intensity for a day or more prior to landfall will elicit greater response than one which intensifies from a 2 to a 4 just six hours prior to landfall or one which weakens from a 4 to a 2 twelve hours prior to landfall. Both media attention and actions by public officials will vary from one strong category 4

hurricane to another due to similar considerations. A large category 4 storm will receive greater attention from media and officials than a small category 4 storm (e.g., Floyd, "Andrew's Big Brother"). Actions by public officials have a great impact on evacuation rate. People are much more likely to evacuate, especially in strong storms, when they believe they have been ordered to evacuate than when they believe they have received a recommendation to evacuate or haven't been told at all whether they should evacuate. A problem is that many people (often 30% in category 1 evacuation zones) fail to hear, comprehend, or believe that evacuation orders apply to them. The methods and aggressiveness used to disseminate evacuation notices affect evacuation rates.

The planning assumptions for evacuation rates are the *maximum probable rates*. They assume that a threatening storm of a given category poses its greatest threat to each county. That is,

1. The storm's forecast track is over the county early and throughout at least a full day of the threat.
2. The storm has been at the specified intensity for at least a day of the threat and remains at that intensity until landfall.
3. The storm makes landfall in the county.

These conditions aren't met very often, and recent threats in the Tampa Bay region have not generated evacuation rates as high as those in some of the planning assumptions. In fact in the 12 storms asked about in one county or another as part of the SRES the highest evacuation rates observed for site-built homes in the category 1 evacuation zone in any county was 80% (Santa Rosa in Ivan and Nassau in Floyd). But evacuation rates over 90% have been documented in other threats (e.g., Escambia in Frederic, parts of Pinellas in Elena, most of coastal Georgia and southern South Carolina in Floyd, and Galveston, Texas in Rita).

Applying the county planning assumptions to the entire region overstates evacuation rate for the region, because not every county in the region will meet the conditions. However, one doesn't know in advance the county to which they will apply, if any.

The planning assumptions assume that officials issue mandatory evacuation orders for surge-related evacuation zones for hurricanes of corresponding intensities (e.g., everyone in the category 1 evacuation zone is ordered to evacuate in a category 1 hurricane). It also assumes that all mobile homes and residents of manufactured housing are ordered to evacuate for hurricanes of all intensities.

The planning assumptions include shadow evacuation – people leaving from areas and structures not ordered by officials to evacuate. These assumptions can add substantially to the total number of people evacuating and generating shelter demand, but the phenomenon exists, particularly when conditions such as those enumerated above apply (storm is forecast for an extended period to strike the county, maintains its intensity, and makes landfall in the county). One reason that shadow evacuation occurs is that many people have misconceptions about their vulnerability.

## 2. Out-of-County Trips

Many evacuees go farther than necessary to reach safety, and the planning assumptions indicate the percentage of evacuees who will go to destinations outside their own county. The Survey Data Report lists the actual destination (i.e., city) where intended evacuees said they would go and where actual evacuees have gone in the past, if they said they would go or went beyond their own neighborhoods. Going out-of-county can increase evacuation clearance times but has occurred in the past and will in the future until officials are more successful at dissuading evacuees from doing so. Very few out-of-county evacuees seek refuge in public shelters. The great majority go to the homes of friends and relatives or to hotels and motels. Because evacuation rates were low in recent storms, out-of-county trip rates are based on the minority of residents who evacuated and might not be the same if evacuation rates had been greater.

## 3. Type of Refuge

There are separate tables for the percentage of evacuees who will go to public shelters, the homes of friends and relatives, hotels and motels, and other types of refuge (such as churches, workplaces, and second homes). Survey respondents tend to overstate their likelihood of using public shelters and understate their likelihood of going to the homes of friends and relatives. Actual refuge use is the best indicator, but in the Tampa Bay region there have been too few evacuees in recent hurricane threats included in the survey to provide highly-reliable estimates at the county level for future planning. (Elena, more than 25 years ago, was an exception, but the hasty, late evacuation was not a typical threat.) Planning assumptions for the counties reflect a reduced value of the intended public shelter use figures unless actual response values were consistent with the intended behavior. The ability of evacuees to actually go to their intended refuge or to the places they have gone in the past will depend of the availability of those refuges in future threats.

## 4. Percent of Available Vehicles

Many evacuating households tend to take only a portion of the vehicles available to them, mainly to avoid separating the family more than necessary. The planning assumptions indicate the percentage of vehicles available to households that will be used in an evacuation. The Survey Data Report includes the number of vehicles available to evacuating households and the number they would take. The percent-of-available figures are derived from those data. Although planners could use the number of vehicles per household from the SRES survey and reported in the Survey Data Report, census data should provide better statistical estimates of the number of vehicles available to households, to which the percent-of-available multipliers can be applied. The SRES survey asked only about intended vehicle use, but a large number of post-storm surveys have asked about actual vehicle use, and the intended use figures tend to match the actual use figures well.

## 5. Evacuation Timing

Not all evacuees leave at the same time. Some leave before public officials issue evacuation notices, some leave very soon following issuance of evacuation notices, and some wait until shortly before they expect the threatening storm to arrive.

### **a. Evidence from Past Evacuations**

Many surveys documenting response following hurricane evacuations have asked evacuees to indicate the time and date when they departed their homes. The responses have been graphed to depict cumulative evacuation curves. The curves show how the evacuation (on the y-axis) grew over time (on the x-axis), typically with a few people leaving early and then increasing to the point at which 100% of the evacuees had eventually departed. The curves indicate when vehicles enter the evacuation network as evacuating vehicles, not when they reached their destinations or when they made other trips in the network prior to evacuating.

In general a graph of when evacuees depart often looks like the letter "S." In some evacuations the "S" is compressed laterally (i.e., over time) to appear thin and upright. Those curves occur when all departures occur in a relatively short period of time. They usually happen when evacuation notices were not issued early enough due to an unexpected change in a storm's track, forward speed, or intensity. By the time evacuation notices are issued, little time remains before anticipated landfall, so evacuees leave with a sense of urgency corresponding to the threat. This would be referred to as a relatively "fast" or "quick" response.

In other evacuations the "S" is stretched laterally and covers more of the length of the line on which it appears, with departures being distributed over a longer length of time. It looks "flatter." In those cases evacuation notices were issued well in advance of anticipated landfall of the storm, and residents were aware that they had the luxury of waiting longer before departing if they choose to do so. Some evacuees do wait longer before leaving, but not all do. Departures are distributed over a longer period of time than in the first example. This might be referred to as a "slow" response.

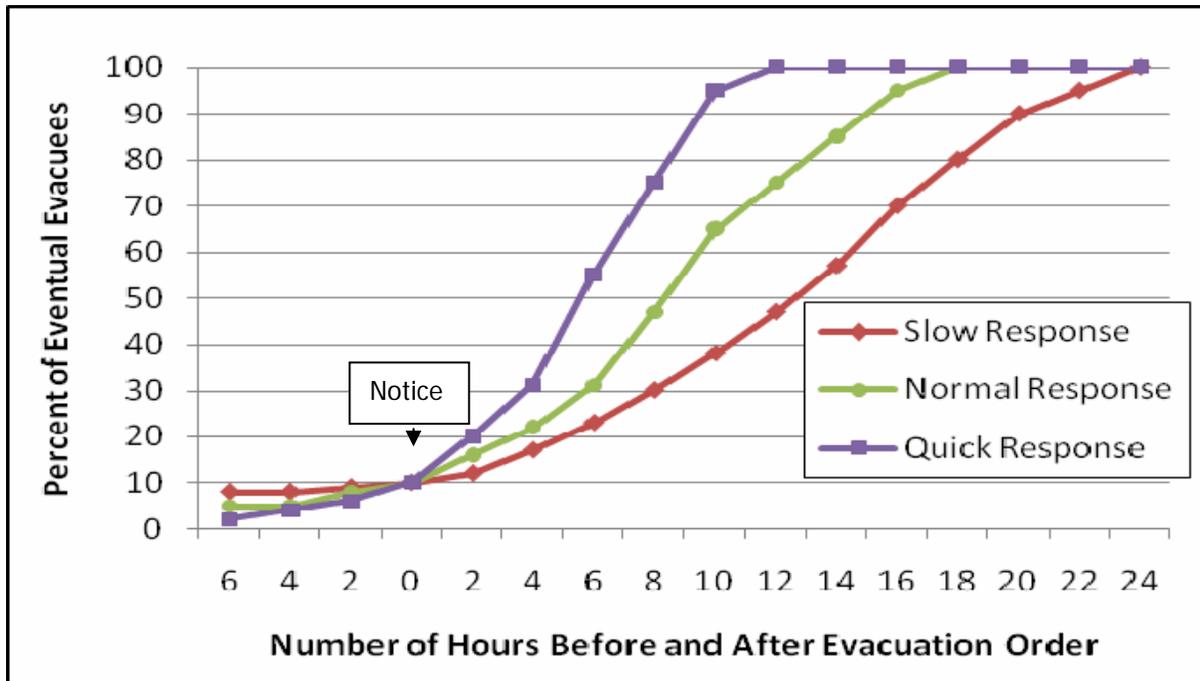
There are also evacuation timing curves that fall between those two, resulting in an "S" that is less compressed than the first, but less stretched than the second. This sort of evacuation results when evacuation notices are issued earlier than in the first example, but not as early as in the second case.

In all three scenarios evacuees collectively take as much time as they believe is available to them. Perceptions about the urgency of the evacuation account for variations in whether the evacuation is "quick," "slow," or in between ("normal").

### **b. Response Curves for Planning**

The three evacuation timing scenarios described above are depicted graphically in Figure III-3, reflecting the three versions of the letter "S." The slowest of the three curves assumes that evacuation notices were issued at least 24 hours before landfall. The fastest of the three assumes that evacuation notices were issued just 12 hours prior to the anticipated onset of hurricane conditions.

**Figure III-3**  
**Response Curves for Evacuation Planning**



### c. Variations in the Curves

The haste in which evacuees depart is mainly a function of the perceived urgency of leaving sooner rather than later. Variations from storm to storm are usually a function of forecasts. If a forecast changes to indicate that landfall will occur sooner than previously anticipated, more people will start leaving. If intensity of a storm increases, indicating that additional areas of a community need to evacuate, departures from those areas will increase. These changes influence public response primarily through evacuation notices and instructions provided by local officials. Officials can significantly affect the distribution of departures by when they issue evacuation notices and how they word the notices and related announcements.

In each threat scenario occupants of less vulnerable areas (e.g., inland) will tend to wait longer to evacuate than those living in more hazardous locations (e.g., beaches). Variation in the curves is a function of variation in the perceived urgency of evacuating promptly, not demographics.

People prefer not to evacuate at night but will do so if necessary. Examples are Eloise, Elena, and Opal. Relatively few people leave prior to the issuance of evacuation notices by officials. People are willing to leave before watches and warnings are posted by the National Hurricane Center if asked to do so by local officials.

#### **d. Examples of Actual Response Curves**

Respondents to the SRES survey were not asked when they departed in past evacuations because too much time had passed between the evacuations and the interviews to trust the accuracy of recollections. The questions would also have made the interviews unacceptably lengthy. There are ample actual response curves that have been documented in other surveys.

##### **(1) Two-day Evacuations**

If officials issue evacuation notices more than 24 hours prior to anticipated landfall, evacuation departures will be distributed over a period longer than 24 hours. Some evacuees will leave shortly after the evacuation notice during daylight hours, then departures will essentially stop on the evening of the first day, and then resume on the morning of the second day.

Most of the recent evacuations in Florida and elsewhere have taken place over a period of more than 24 hours. This has been the result of evacuation notices having been issued more than 24 hours prior to arrival of the storms. Curves were constructed for 11 different coastal regions in Florida, for example, including four regions in Florida, and all 11 curves were distributed over more than a 24-hour period. All four of the 2004 major hurricanes in Florida (Charley, Frances, Ivan, and Jeanne) had evacuations that covered more than 24 hours. Evacuation departures in Katrina in Mississippi and Louisiana and in Rita in Texas in 2005 occurred over a period of two days or more. The same was true of Bertha and Fran in South Carolina in 1996, Georges in Florida in 1998, Lili in Texas and Louisiana in 2002, and Isabel in Virginia and Maryland in 2003.

##### **(2) One-day Evacuations**

The prevalence of two-evacuations stems from good forecasts and a precautionary approach by public safety officials, particularly in stronger storms. If the National Hurricane Center goes forward with plans to extend the lead times for Hurricane Watches and Warnings by 12 hours, early issuance of evacuation notices will probably continue.

However, good early forecasts won't always be the case, or for other reasons evacuations notices won't be issued early enough to afford the luxury of having two days in which to evacuate. In those instances evacuations in certain areas will need to be rushed to completion following issuance of evacuation notices, and the duration of evacuations will be less than two days. If the goal of clearance time calculations is to estimate the minimum amount of time necessary to complete an evacuation safely, response curves of shorter duration than two days should be assumed.

The quickest of the one-day curves assumes that all evacuees depart within 12 hours of an evacuation notice being issued, with just 10% having left prior to the evacuation notice. Examples of approximately 12-hour response curves are Broward and Miami-Dade Counties in Andrew in 1992, Pinellas County in Elena in 1985, and Escambia County in Frederic in 1979. Storms in which evacuation departures were

distributed over a 12 to 18 hour period include David in Miami-Dade in 1979 and Opal in northwest Florida in 1995. Eloise in northwest Florida in 1975 is a rare example of evacuation departures occurring over a period of just six hours, but in some locations as little as 45% of the public evacuated.

## F. Planning Assumptions for Vacationers

Compared to residents, there is relatively little data documenting how vacationers respond to hurricane threats, and no SRES survey was conducted with vacationers to ascertain their intentions. Recommendations for behavioral assumptions for tourists are derived from intended-response survey findings with visitors to other locations and from existing data on how vacationers have responded in other locations, including the Carolinas.

### 1. Evacuation Rates

There is no evidence that vacationers are reluctant to evacuate when a hurricane interrupts their visit to a coastal community. Based on observations of vacationer behavior in other locations and surveys in other locations concerning intended responses, it is reasonable to assume that 90% to 95% of vacationers will evacuate their accommodations *if evacuation orders are issued*.

### 2. Type of Refuge

Officials sometimes report a large number of vacationers in public shelters, but they represent a very small percentage of the total visitor population. Fewer than 5% of the evacuating vacationers will go to public shelters. Between 25% and 50% will seek inland hotels and motels. The remainder will return home or stay with friends and relatives in Florida, although the number returning home will depend on the distances traveled by tourists from home. Those most likely to return home live within a one-day drive of where they vacation.

### 3. Destinations

Up to 5% of tourist evacuees will stay within the county where their vacation accommodations were located or go to a nearby county to use a public shelter. At least half will go elsewhere in Florida to continue their vacation or wait out the storm. Up to half will return home, if they live within a one-day drive.

### 4. Vehicle Use

The great majority of tourists have a vehicle available to them when on vacation, often their own. Virtually all of the vehicles will be used in evacuating, either to other tourist destinations, home, or airports.

### 5. Evacuation Timing

Tourists leave at least as early as residents. The same curves used for residents should be used for tourists, unless officials order vacationers to evacuate earlier.

## G. Planning Assumptions Tables

Planning assumptions for evacuation behavior form the final product of behavioral analysis and are subsequently used as inputs for the transportation modeling effort. Reasonable and accurate assumptions are an important element of any modeling process. Planning

assumptions for the Statewide Regional Evacuation Studies program are derived using professional analysis of statewide survey results with a cross comparison of previous behavioral analyses. A more complete explanation of the methodology used to derive planning assumptions in Volume II. A set of planning assumptions for each of the counties in the Tampa Bay Region is listed in Appendix IIIA, IIIB, IIIC, and IIID.

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## **APPENDIX IIIA**

# **Planning Assumptions for Hillsborough County**

### **CHAPTER III**

### **REGIONAL BEHAVIORAL ANALYSES SUMMARY**

## Appendix IIIA Table of Contents

Table IIIA-1	Hillsborough County Evacuation rate for site-built homes
Table IIIA-2	Hillsborough County Public shelter use rates for site-built homes
Table IIIA-3	Hillsborough County Out-of-county trip rates for site-built homes
Table IIIA-4	Hillsborough County Percent of available vehicles to be used by site-built homes
Table IIIA-5	Hillsborough County Evacuation rate for mobile and manufactured homes
Table IIIA-6	Hillsborough County Public shelter use rates for mobile and manufactured homes
Table IIIA-7	Hillsborough County Out-of-county trip rates for mobile and manufactured homes
Table IIIA-8	Hillsborough County Percent of available vehicles to be used by mobile and manufactured homes

Hillsborough Evacuation Rates (%)	Storm Threat Scenario				
Site-built Homes	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	50	60	70	85	95
Cat 2 Surge Evacuation Zone	35	55	75	85	95
Cat 3 Surge Evacuation Zone	25	30	75	85	90
Cat 4 Surge Evacuation Zone	15	20	30	75	90
Cat 5 Surge Evacuation Zone	10	10	15	55	90
Inland of Surge Evacuation Zones	5	5	5	10	20

*Evacuation rate indicates the percent of residents who will leave their homes to go someplace safer from each zone in each storm threat scenario. Figures are based on the assumption that officials order evacuation for surge evacuation zones corresponding to storm category, plus all mobile homes and manufactured homes. Figures also assume that the actual storm track passes very close to the area being evacuated.*

Hillsborough Public Shelter Use (%)	Storm Threat Scenario				
Site-built Homes	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	5	5	5	5	5
Cat 2 Surge Evacuation Zone	5	5	5	5	5
Cat 3 Surge Evacuation Zone	5	5	5	5	5
Cat 4 Surge Evacuation Zone	10	10	10	10	10
Cat 5 Surge Evacuation Zone	10	10	10	10	10
Inland of Surge Evacuation Zones	10	10	10	15	15

*Public shelter use rate indicates the percent of evacuees from each zone who will seek refuge in public shelters, in each storm threat scenario.*

Hillsborough Out-of-county Trips (%)	Storm Threat Scenario				
Site-built Homes	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	50	50	55	55	55
Cat 2 Surge Evacuation Zone	45	45	45	50	50
Cat 3 Surge Evacuation Zone	45	45	45	50	50
Cat 4 Surge Evacuation Zone	45	45	45	50	50
Cat 5 Surge Evacuation Zone	45	45	45	50	50
Inland of Surge Evacuation Zones	50	50	50	50	50

*Out-of-county trip rate indicates the percent of evacuees from each zone who will seek refuge outside their own county of residence.*

Hillsborough Vehicle Use Rate (%)	Storm Threat Scenario				
Site-built Homes	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	75	75	75	75	75
Cat 2 Surge Evacuation Zone	75	75	75	75	75
Cat 3 Surge Evacuation Zone	75	75	75	75	75
Cat 4 Surge Evacuation Zone	75	75	75	75	75
Cat 5 Surge Evacuation Zone	75	75	75	75	75
Inland of Surge Evacuation Zones	75	75	75	75	75

*Vehicle use rate indicates of percentage of vehicles available to the evacuating household from each zone that will be used in evacuation in each storm threat scenario.*

Hillsborough Evacuation Rates (%)	Storm Threat Scenario				
Mobile and Manufactured Homes	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	80	80	85	95	100
Cat 2 Surge Evacuation Zone	65	70	80	90	95
Cat 3 Surge Evacuation Zone	60	65	80	90	95
Cat 4 Surge Evacuation Zone	60	65	75	80	85
Cat 5 Surge Evacuation Zone	60	65	75	80	85
Inland of Surge Evacuation Zones	50	60	65	75	80

*Evacuation rate indicates the percent of residents who will leave their homes to go someplace safer from each zone in each storm threat scenario. Figures are based on the assumption that officials order evacuation for surge evacuation zones corresponding to storm category, plus all mobile homes and manufactured homes. Figures also assume that the actual storm track passes very close to the area being evacuated.*

Hillsborough Public Shelter Use (%)	Storm Threat Scenario				
Mobile and Manufactured Homes	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	10	10	10	10	10
Cat 2 Surge Evacuation Zone	10	10	10	10	10
Cat 3 Surge Evacuation Zone	10	10	10	10	10
Cat 4 Surge Evacuation Zone	15	15	15	15	15
Cat 5 Surge Evacuation Zone	15	15	15	15	15
Inland of Surge Evacuation Zones	5	5	5	5	5

*Public shelter use rate indicates the percent of evacuees from each zone who will seek refuge in public shelters, in each storm threat scenario.*

Hillsborough Out-of-county Trips (%)	Storm Threat Scenario				
Mobile and Manufactured Homes	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	30	30	35	35	40
Cat 2 Surge Evacuation Zone	30	30	35	35	40
Cat 3 Surge Evacuation Zone	30	30	35	35	40
Cat 4 Surge Evacuation Zone	30	30	35	35	40
Cat 5 Surge Evacuation Zone	30	30	35	35	40
Inland of Surge Evacuation Zones	30	35	40	40	45

*Out-of-county trip rate indicates the percent of evacuees from each zone who will seek refuge outside their own county of residence.*

Hillsborough Vehicle Use Rate (%)	Storm Threat Scenario				
Mobile and Manufactured Homes	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	85	85	85	85	85
Cat 2 Surge Evacuation Zone	85	85	85	85	85
Cat 3 Surge Evacuation Zone	85	85	85	85	85
Cat 4 Surge Evacuation Zone	85	85	85	85	85
Cat 5 Surge Evacuation Zone	85	85	85	85	85
Inland of Surge Evacuation Zones	85	85	85	85	85

*Vehicle use rate indicates of percentage of vehicles available to the evacuating household from each zone that will be used in evacuation in each storm threat scenario.*



## **APPENDIX IIIB**

# **Planning Assumptions for Manatee County**

### **CHAPTER III**

### **REGIONAL BEHAVIORAL ANALYSES SUMMARY**

## Appendix IIIB Table of Contents

Table IIIB-1	Manatee County Evacuation rate for site-built homes
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<b>Manatee Evacuation Rates (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	50	55	75	85	95
Cat 2 Surge Evacuation Zone	35	60	70	80	95
Cat 3 Surge Evacuation Zone	25	25	70	80	90
Cat 4 Surge Evacuation Zone	10	15	30	75	85
Cat 5 Surge Evacuation Zone	5	10	15	50	85
Inland of Surge Evacuation Zones	5	10	15	15	20

*Evacuation rate indicates the percent of residents who will leave their homes to go someplace safer from each zone in each storm threat scenario. Figures are based on the assumption that officials order evacuation for surge evacuation zones corresponding to storm category, plus all mobile homes and manufactured homes. Figures also assume that the actual storm track passes very close to the area being evacuated.*

<b>Manatee Public Shelter Use (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	5	5	5	5	5
Cat 2 Surge Evacuation Zone	8	8	8	8	8
Cat 3 Surge Evacuation Zone	8	8	8	8	8
Cat 4 Surge Evacuation Zone	10	10	10	10	10
Cat 5 Surge Evacuation Zone	10	10	10	10	10
Inland of Surge Evacuation Zones	15	15	15	15	15

*Public shelter use rate indicates the percent of evacuees from each zone who will seek refuge in public shelters, in each storm threat scenario.*

<b>Manatee Out-of-county Trips (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	50	50	55	55	60
Cat 2 Surge Evacuation Zone	45	45	50	55	60
Cat 3 Surge Evacuation Zone	45	45	50	55	60
Cat 4 Surge Evacuation Zone	40	40	45	50	55
Cat 5 Surge Evacuation Zone	40	40	45	50	55
Inland of Surge Evacuation Zones	40	40	45	50	50

*Out-of-county trip rate indicates the percent of evacuees from each zone who will seek refuge outside their own county of residence.*

<b>Manatee Vehicle Use Rate (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	70	70	70	70	70
Cat 2 Surge Evacuation Zone	70	70	70	70	70
Cat 3 Surge Evacuation Zone	70	70	70	70	70
Cat 4 Surge Evacuation Zone	70	70	70	70	70
Cat 5 Surge Evacuation Zone	70	70	70	70	70
Inland of Surge Evacuation Zones	70	70	70	70	70

*Vehicle use rate indicates of percentage of vehicles available to the evacuating household from each zone that will be used in evacuation in each storm threat scenario.*

<b>Manatee Evacuation Rates (%)</b>	<b>Storm Threat Scenario</b>				
<b>Mobile and Manufactured Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	80	85	90	95	95
Cat 2 Surge Evacuation Zone	70	75	85	90	95
Cat 3 Surge Evacuation Zone	70	75	85	90	95
Cat 4 Surge Evacuation Zone	70	75	80	85	90
Cat 5 Surge Evacuation Zone	70	75	80	85	90
Inland of Surge Evacuation Zones	60	65	75	80	85

*Evacuation rate indicates the percent of residents who will leave their homes to go someplace safer from each zone in each storm threat scenario. Figures are based on the assumption that officials order evacuation for surge evacuation zones corresponding to storm category, plus all mobile homes and manufactured homes. Figures also assume that the actual storm track passes very close to the area being evacuated.*

Manatee Public Shelter Use (%) Mobile and Manufactured Homes	Storm Threat Scenario				
	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	10	10	10	10	10
Cat 2 Surge Evacuation Zone	12	12	12	15	15
Cat 3 Surge Evacuation Zone	12	12	12	15	15
Cat 4 Surge Evacuation Zone	10	10	10	10	10
Cat 5 Surge Evacuation Zone	10	10	10	10	10
Inland of Surge Evacuation Zones	10	10	10	10	10

*Public shelter use rate indicates the percent of evacuees from each zone who will seek refuge in public shelters, in each storm threat scenario.*

Manatee Out-of-county Trips (%) Mobile and Manufactured Homes	Storm Threat Scenario				
	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	30	30	35	40	40
Cat 2 Surge Evacuation Zone	25	25	30	40	40
Cat 3 Surge Evacuation Zone	25	25	30	40	40
Cat 4 Surge Evacuation Zone	25	25	30	30	30
Cat 5 Surge Evacuation Zone	25	25	30	30	30
Inland of Surge Evacuation Zones	25	25	30	30	30

*Out-of-county trip rate indicates the percent of evacuees from each zone who will seek refuge outside their own county of residence.*

Manatee Vehicle Use Rate (%) Mobile and Manufactured Homes	Storm Threat Scenario				
	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Cat 1 Surge Evacuation Zone	90	90	90	90	90
Cat 2 Surge Evacuation Zone	90	90	90	90	90
Cat 3 Surge Evacuation Zone	90	90	90	90	90
Cat 4 Surge Evacuation Zone	90	90	90	90	90
Cat 5 Surge Evacuation Zone	90	90	90	90	90
Inland of Surge Evacuation Zones	90	90	90	90	90

*Vehicle use rate indicates of percentage of vehicles available to the evacuating household from each zone that will be used in evacuation in each storm threat scenario.*



## **APPENDIX IIIC**

# **Planning Assumptions for Pasco County**

### **CHAPTER III**

### **REGIONAL BEHAVIORAL ANALYSES SUMMARY**

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<b>Pasco Evacuation Rates (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	50	65	75	85	95
Cat 2 Surge Evacuation Zone	30	50	70	80	95
Cat 3 Surge Evacuation Zone	20	20	70	80	90
Cat 4 Surge Evacuation Zone	10	10	30	75	85
Cat 5 Surge Evacuation Zone	5	5	15	50	80
Inland of Surge Evacuation Zones	5	5	10	10	15

*Evacuation rate indicates the percent of residents who will leave their homes to go someplace safer from each zone in each storm threat scenario. Figures are based on the assumption that officials order evacuation for surge evacuation zones corresponding to storm category, plus all mobile homes and manufactured homes. Figures also assume that the actual storm track passes very close to the area being evacuated.*

<b>Pasco Public Shelter Use (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	5	5	5	5	5
Cat 2 Surge Evacuation Zone	5	5	5	5	5
Cat 3 Surge Evacuation Zone	10	10	10	10	10
Cat 4 Surge Evacuation Zone	10	10	10	10	10
Cat 5 Surge Evacuation Zone	10	10	10	10	10
Inland of Surge Evacuation Zones	10	10	10	10	10

*Public shelter use rate indicates the percent of evacuees from each zone who will seek refuge in public shelters, in each storm threat scenario.*

<b>Pasco Out-of-county Trips (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	40	45	45	45	50
Cat 2 Surge Evacuation Zone	40	40	45	45	50
Cat 3 Surge Evacuation Zone	40	40	45	45	50
Cat 4 Surge Evacuation Zone	40	40	45	45	50
Cat 5 Surge Evacuation Zone	40	40	45	45	50
Inland of Surge Evacuation Zones	40	40	45	45	50

*Out-of-county trip rate indicates the percent of evacuees from each zone who will seek refuge outside their own county of residence.*

<b>Pasco Vehicle Use Rate (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	80	80	80	80	80
Cat 2 Surge Evacuation Zone	80	80	80	80	80
Cat 3 Surge Evacuation Zone	80	80	80	80	80
Cat 4 Surge Evacuation Zone	75	75	75	75	75
Cat 5 Surge Evacuation Zone	75	75	75	75	75
Inland of Surge Evacuation Zones	70	70	70	70	70

*Vehicle use rate indicates of percentage of vehicles available to the evacuating household from each zone that will be used in evacuation in each storm threat scenario.*

<b>Pasco Evacuation Rates (%)</b>	<b>Storm Threat Scenario</b>				
<b>Mobile and Manufactured Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	80	85	90	95	100
Cat 2 Surge Evacuation Zone	70	80	85	95	95
Cat 3 Surge Evacuation Zone	70	75	85	90	90
Cat 4 Surge Evacuation Zone	70	75	85	85	90
Cat 5 Surge Evacuation Zone	70	75	80	85	90
Inland of Surge Evacuation Zones	60	70	80	80	90

*Evacuation rate indicates the percent of residents who will leave their homes to go someplace safer from each zone in each storm threat scenario. Figures are based on the assumption that officials order evacuation for surge evacuation zones corresponding to storm category, plus all mobile homes and manufactured homes. Figures also assume that the actual storm track passes very close to the area being evacuated.*

<b>Pasco Public Shelter Use (%)</b> <b>Mobile and Manufactured Homes</b>	<b>Storm Threat Scenario</b>				
	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	15	15	15	15	15
Cat 2 Surge Evacuation Zone	10	10	10	10	10
Cat 3 Surge Evacuation Zone	10	10	10	10	10
Cat 4 Surge Evacuation Zone	15	15	15	15	15
Cat 5 Surge Evacuation Zone	15	15	15	15	15
Inland of Surge Evacuation Zones	15	15	15	15	15

*Public shelter use rate indicates the percent of evacuees from each zone who will seek refuge in public shelters, in each storm threat scenario.*

<b>Pasco Out-of-county Trips (%)</b> <b>Mobile and Manufactured Homes</b>	<b>Storm Threat Scenario</b>				
	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	30	30	35	35	40
Cat 2 Surge Evacuation Zone	25	25	30	30	40
Cat 3 Surge Evacuation Zone	25	25	30	30	40
Cat 4 Surge Evacuation Zone	25	25	30	30	35
Cat 5 Surge Evacuation Zone	25	25	30	30	35
Inland of Surge Evacuation Zones	25	25	30	30	35

*Out-of-county trip rate indicates the percent of evacuees from each zone who will seek refuge outside their own county of residence.*

<b>Pasco Vehicle Use Rate (%)</b> <b>Mobile and Manufactured Homes</b>	<b>Storm Threat Scenario</b>				
	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	90	90	90	90	90
Cat 2 Surge Evacuation Zone	90	90	90	90	90
Cat 3 Surge Evacuation Zone	90	90	90	90	90
Cat 4 Surge Evacuation Zone	90	90	90	90	90
Cat 5 Surge Evacuation Zone	90	90	90	90	90
Inland of Surge Evacuation Zones	80	80	80	80	80

*Vehicle use rate indicates of percentage of vehicles available to the evacuating household from each zone that will be used in evacuation in each storm threat scenario.*



## **APPENDIX IIID**

# **Planning Assumptions for Pinellas County**

### **CHAPTER III**

### **REGIONAL BEHAVIORAL ANALYSES SUMMARY**

## Appendix IIID Table of Contents

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Table IIID-8	Pinellas County Percent of available vehicles to be used by mobile/ manufactured homes

<b>Pinellas Evacuation Rates (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	55	65	75	85	95
Cat 2 Surge Evacuation Zone	30	50	70	80	95
Cat 3 Surge Evacuation Zone	20	25	70	80	90
Cat 4 Surge Evacuation Zone	10	15	30	75	85
Cat 5 Surge Evacuation Zone	5	10	15	50	85
Inland of Surge Evacuation Zones	5	5	10	10	20

*Evacuation rate indicates the percent of residents who will leave their homes to go someplace safer from each zone in each storm threat scenario. Figures are based on the assumption that officials order evacuation for surge evacuation zones corresponding to storm category, plus all mobile homes and manufactured homes. Figures also assume that the actual storm track passes very close to the area being evacuated.*

<b>Pinellas Public Shelter Use (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	5	5	5	5	5
Cat 2 Surge Evacuation Zone	5	5	5	5	5
Cat 3 Surge Evacuation Zone	5	5	5	5	5
Cat 4 Surge Evacuation Zone	8	8	8	8	8
Cat 5 Surge Evacuation Zone	8	8	8	8	8
Inland of Surge Evacuation Zones	10	10	10	10	10

*Public shelter use rate indicates the percent of evacuees from each zone who will seek refuge in public shelters, in each storm threat scenario.*

<b>Pinellas Out-of-county Trips (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	55	55	55	60	60
Cat 2 Surge Evacuation Zone	50	50	50	55	55
Cat 3 Surge Evacuation Zone	50	50	50	55	55
Cat 4 Surge Evacuation Zone	50	50	50	55	55
Cat 5 Surge Evacuation Zone	50	50	50	55	55
Inland of Surge Evacuation Zones	50	50	50	55	55

*Out-of-county trip rate indicates the percent of evacuees from each zone who will seek refuge outside their own county of residence.*

<b>Pinellas Vehicle Use Rate (%)</b>	<b>Storm Threat Scenario</b>				
<b>Site-built Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	80	80	80	80	80
Cat 2 Surge Evacuation Zone	75	75	75	75	75
Cat 3 Surge Evacuation Zone	75	75	75	75	75
Cat 4 Surge Evacuation Zone	75	75	75	75	75
Cat 5 Surge Evacuation Zone	75	75	75	75	75
Inland of Surge Evacuation Zones	75	75	75	75	75

*Vehicle use rate indicates of percentage of vehicles available to the evacuating household from each zone that will be used in evacuation in each storm threat scenario.*

<b>Pinellas Evacuation Rates (%)</b>	<b>Storm Threat Scenario</b>				
<b>Mobile and Manufactured Homes</b>	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	80	80	90	100	100
Cat 2 Surge Evacuation Zone	70	80	85	95	95
Cat 3 Surge Evacuation Zone	70	75	85	90	95
Cat 4 Surge Evacuation Zone	70	75	85	90	95
Cat 5 Surge Evacuation Zone	70	75	80	90	95
Inland of Surge Evacuation Zones	65	70	80	85	90

*Evacuation rate indicates the percent of residents who will leave their homes to go someplace safer from each zone in each storm threat scenario. Figures are based on the assumption that officials order evacuation for surge evacuation zones corresponding to storm category, plus all mobile homes and manufactured homes. Figures also assume that the actual storm track passes very close to the area being evacuated.*

<b>Pinellas Public Shelter Use (%)</b> <b>Mobile and Manufactured Homes</b>	<b>Storm Threat Scenario</b>				
	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	10	10	10	10	10
Cat 2 Surge Evacuation Zone	10	10	10	10	10
Cat 3 Surge Evacuation Zone	10	10	10	10	10
Cat 4 Surge Evacuation Zone	10	10	10	10	10
Cat 5 Surge Evacuation Zone	10	10	10	10	10
Inland of Surge Evacuation Zones	15	15	15	15	15

*Public shelter use rate indicates the percent of evacuees from each zone who will seek refuge in public shelters, in each storm threat scenario.*

<b>Pinellas Out-of-county Trips (%)</b> <b>Mobile and Manufactured Homes</b>	<b>Storm Threat Scenario</b>				
	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	25	25	30	35	40
Cat 2 Surge Evacuation Zone	25	25	30	30	35
Cat 3 Surge Evacuation Zone	25	25	30	30	35
Cat 4 Surge Evacuation Zone	25	25	30	30	35
Cat 5 Surge Evacuation Zone	25	25	30	30	35
Inland of Surge Evacuation Zones	25	25	30	30	35

*Out-of-county trip rate indicates the percent of evacuees from each zone who will seek refuge outside their own county of residence.*

<b>Pinellas Vehicle Use Rate (%)</b> <b>Mobile and Manufactured Homes</b>	<b>Storm Threat Scenario</b>				
	<b>Cat 1</b>	<b>Cat 2</b>	<b>Cat 3</b>	<b>Cat 4</b>	<b>Cat 5</b>
Cat 1 Surge Evacuation Zone	85	85	85	85	85
Cat 2 Surge Evacuation Zone	85	85	85	85	85
Cat 3 Surge Evacuation Zone	85	85	85	85	85
Cat 4 Surge Evacuation Zone	85	85	85	85	85
Cat 5 Surge Evacuation Zone	85	85	85	85	85
Inland of Surge Evacuation Zones	85	85	85	85	85

*Vehicle use rate indicates of percentage of vehicles available to the evacuating household from each zone that will be used in evacuation in each storm threat scenario.*