

Florida's Statewide Regional Evacuation Study (SRES)

Florida Regions

1. West Florida
2. Apalachee
3. North Central Florida
4. Northeast Florida
5. Withlacoochee
6. East Central Florida
7. Central Florida
8. Tampa Bay
9. Southwest Florida
10. Treasure Coast
11. South Florida



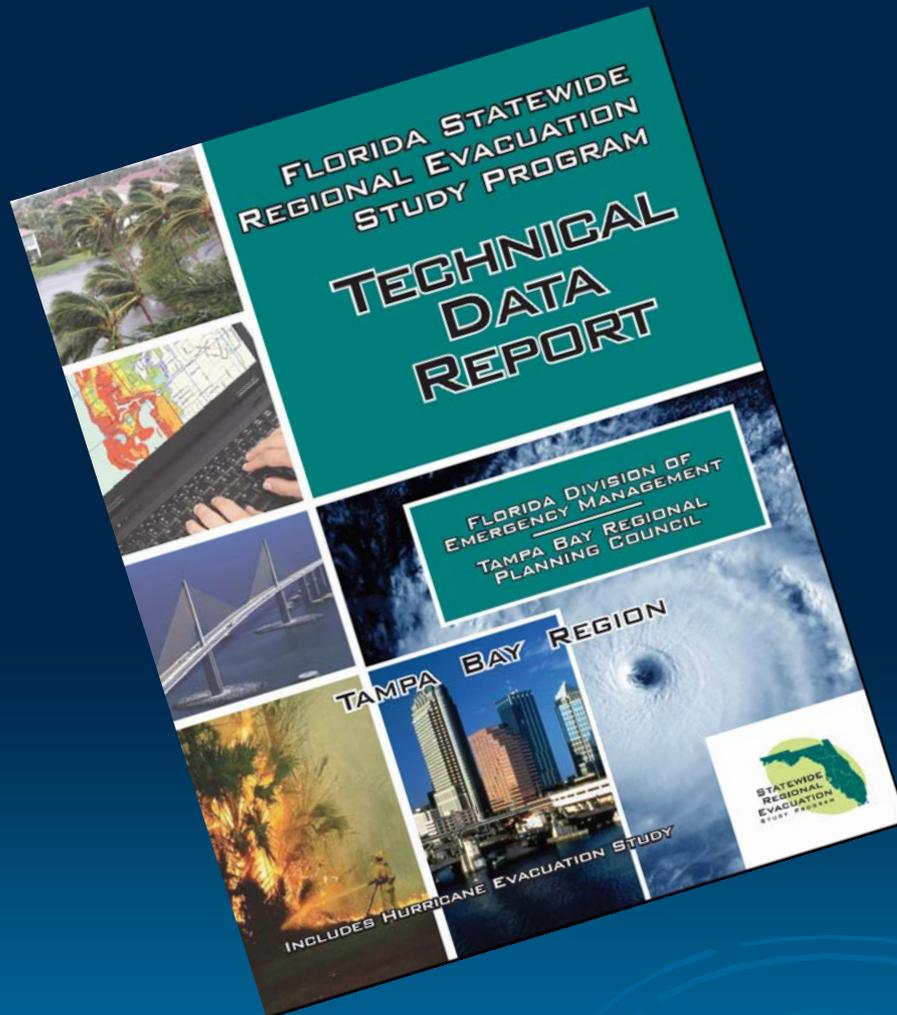
Release of the Statewide Regional Evacuation Study for the Tampa Bay Region

Betti C. Johnson, AICP
Tampa Bay Regional Planning Council

Florida's Statewide Regional Evacuation Study (SRES)



Technical Data Report

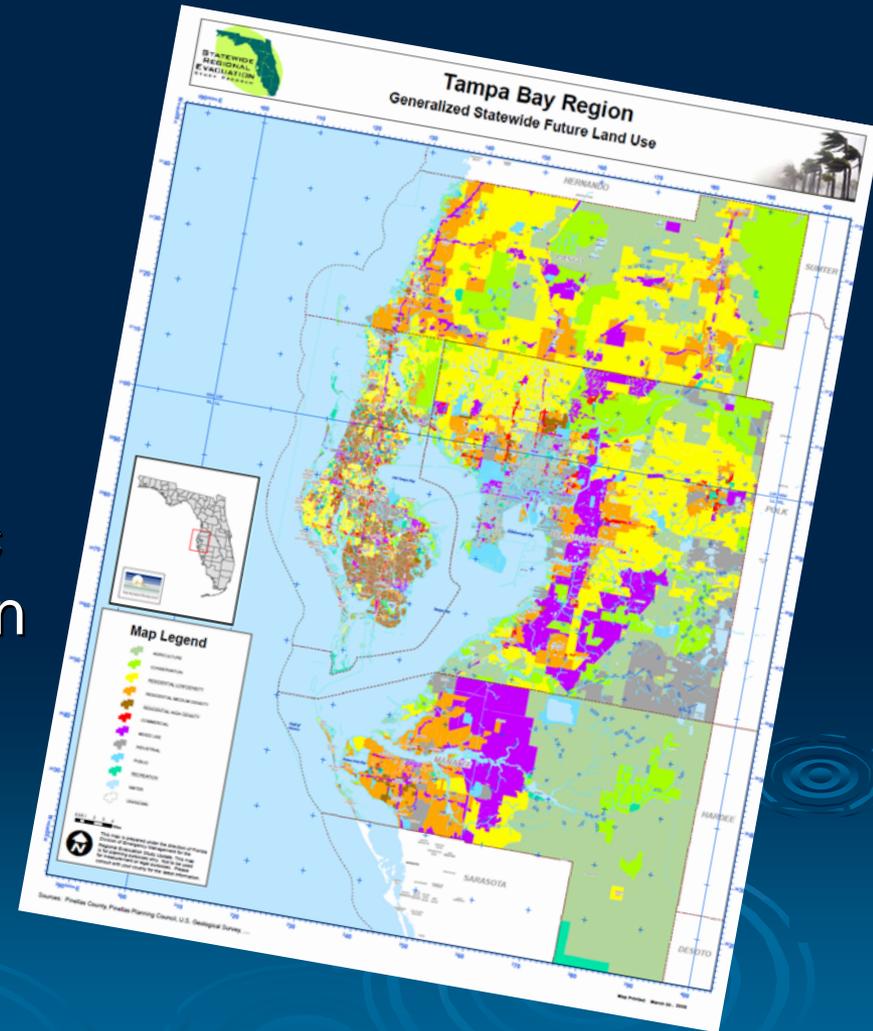


- Executive Summary
- Demographics and Land Use
- Hazards Analysis
- Behavioral Analysis
- Vulnerability Analysis
- Shelter Analysis
- Evacuation Transportation Analysis

I. Demographics and Land Use

➤ County Profiles

- Population
- Socio-economic Characteristics
 - Income, Age, Linguistic Isolation, Transportation Dependent



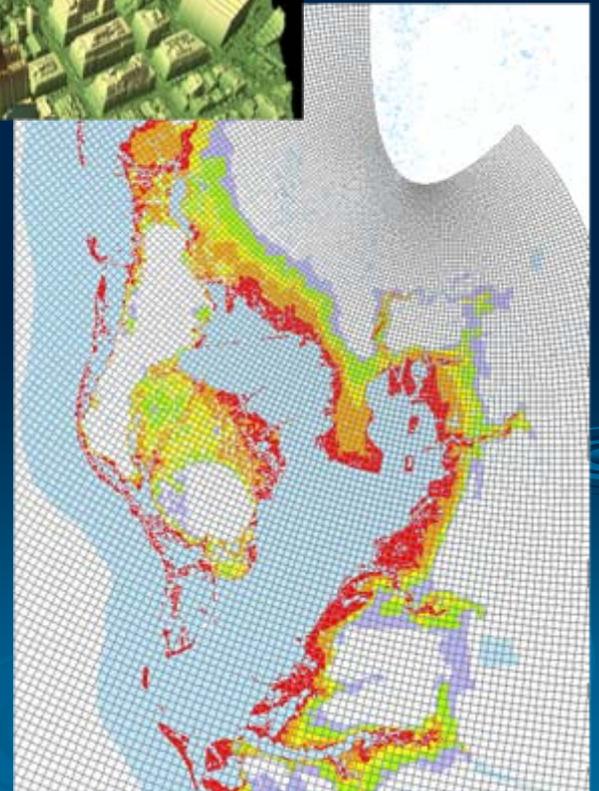
II. Regional Hazards Analysis

- All-Hazards Approach
 - Tropical Storms and Hurricanes
 - Flooding Events
 - Wildfire



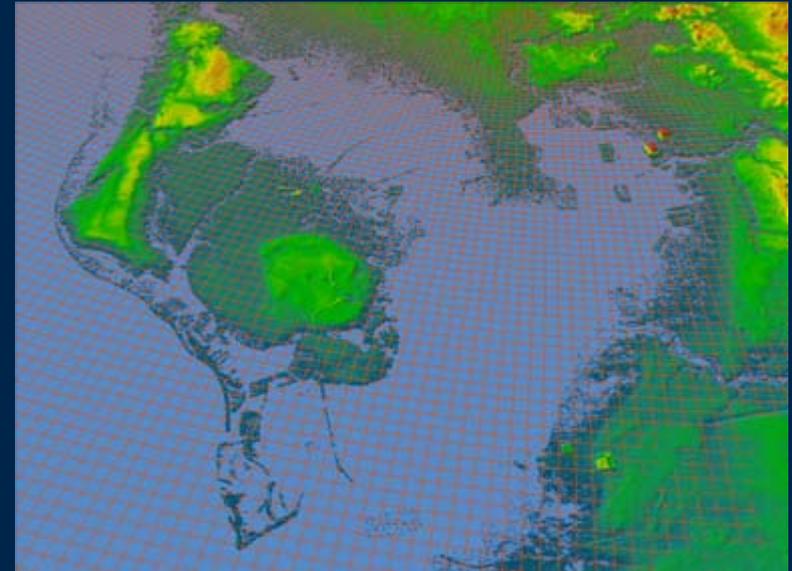
LIDAR & NOAA's SLOSH Model

- LIDAR collected in coastal counties
- SLOSH Model updated
- Basin updated with LIDAR topography

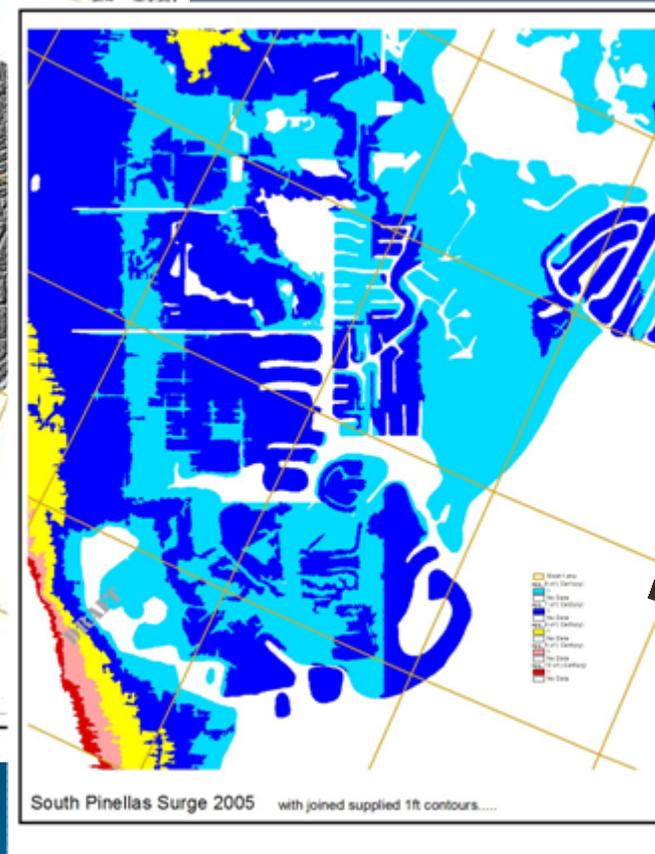
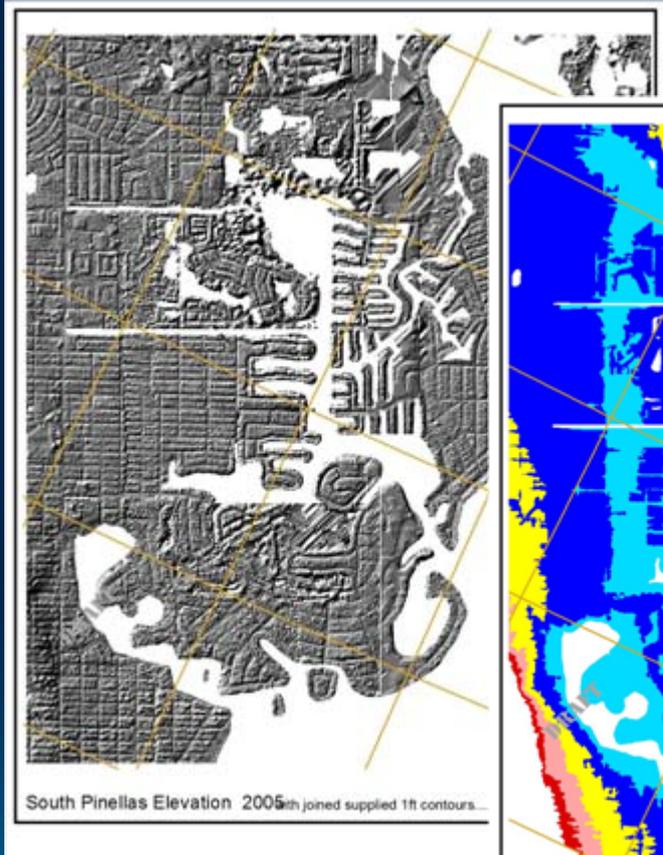


LIDAR & NOAA's SLOSH Model

- Datum updated to NAVD88
- 12,000 hypothetical storms modeled with varying forward speed, size and astronomical tide
- Surge heights at 3,500 grid points



Storm Tide Analysis



III. Behavioral Analysis

- Statewide Surveys
- General Response Model

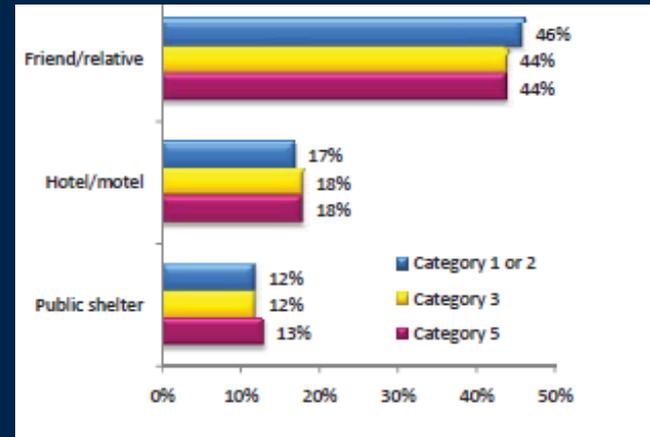


Behavioral Analysis

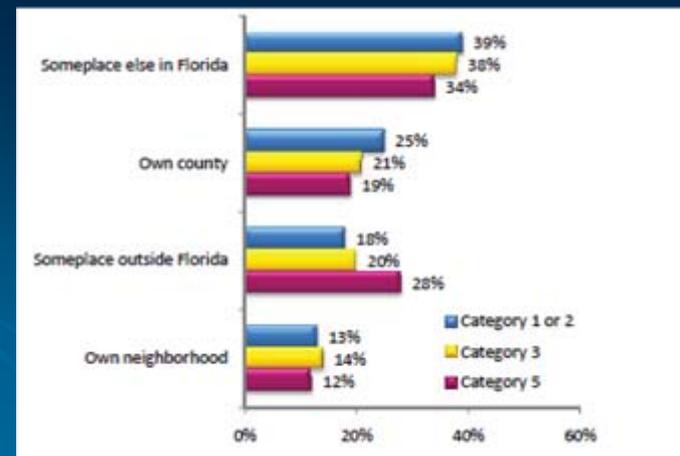
- Evacuation Participation Rate
- Evacuation Timing
- Evacuation Refuge
- Evacuation Destination
- Vehicle Use

Volume 2: Behavioral Analysis
Volume 3: Behavioral Survey
Report

Evacuation Destinations by Type



Evacuation Destinations by Location

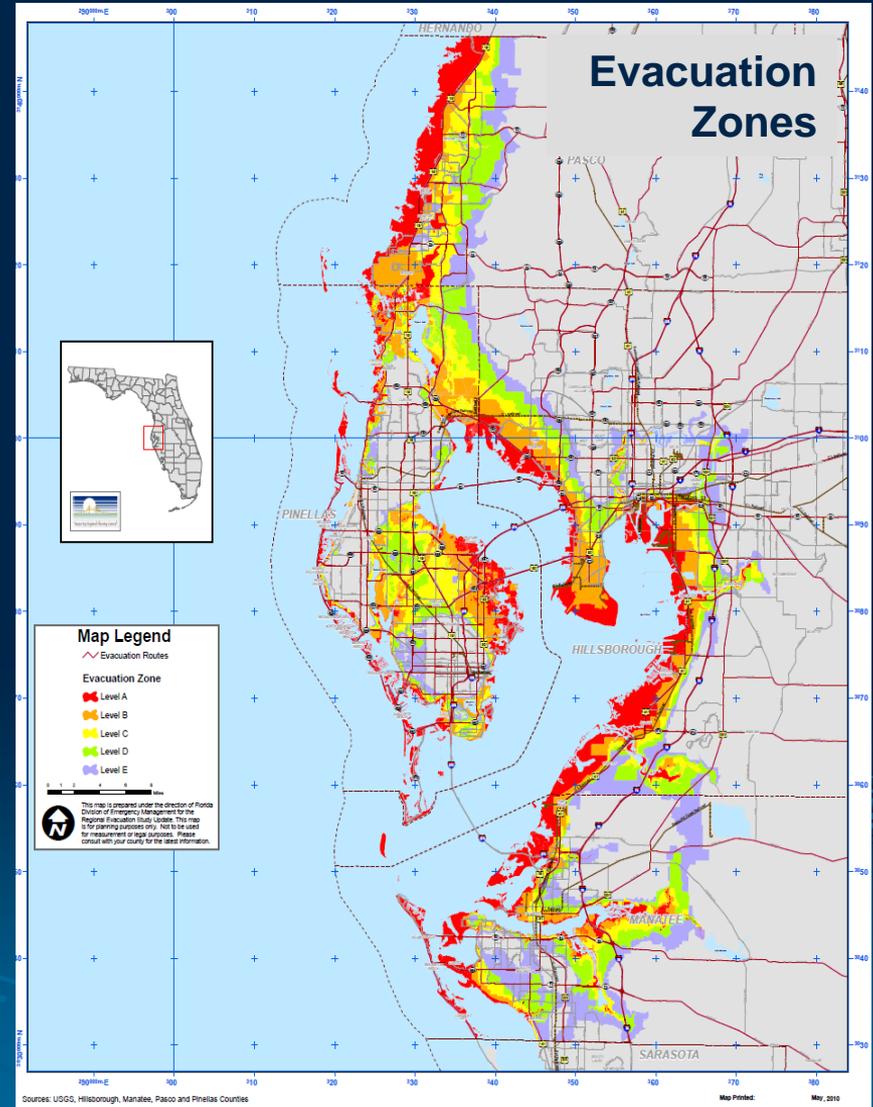
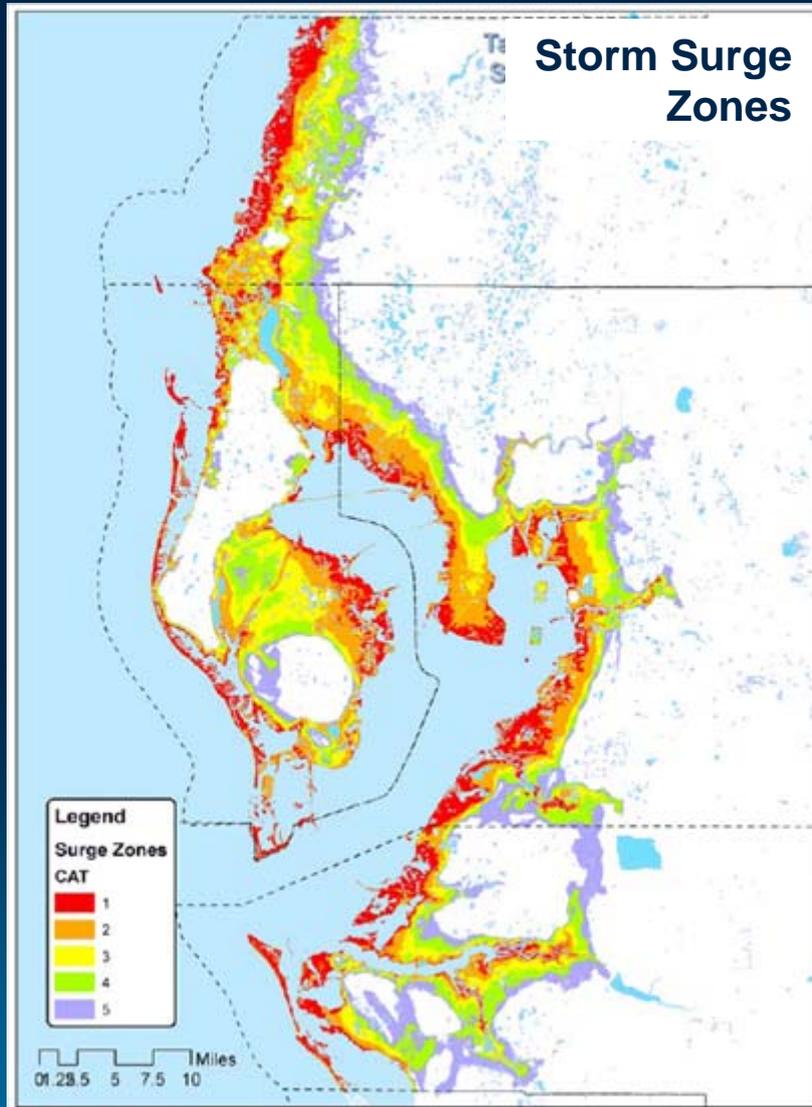


IV. Vulnerability and Population Analysis

- Evacuation zones
- Populations-at-risk
- Evacuation population
- Vulnerability of Critical Facilities



Surge Zones and Evacuation Zones



Population-at-Risk

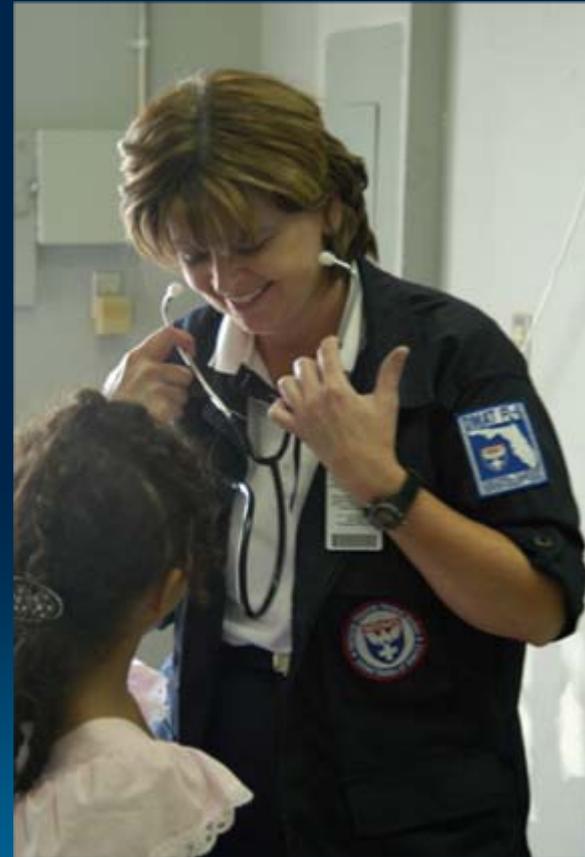
Table VI-4 Vulnerable Population in the Tampa Bay Region for 2010

	Evacuation Zone A	Evacuation Zone B	Evacuation Zone C	Evacuation Zone D	Evacuation Zone E
Hillsborough County					
Site-built Homes	81,698	106,164	59,233	65,805	66,996
Mobile/Manuf. Homes	3,677	2,599	1,883	3,065	3,989
TOTAL	85,375	108,763	61,116	68,870	70,985
Manatee County					
Site-built Homes	39,227	23,434	28,902	60,097	85,350
Mobile/Manuf. Homes	3,270	2,668	2,043	4,577	4,735
TOTAL	42,497	26,102	30,945	64,674	90,085
Pasco County					
Site-built Homes	40,286	47,938	62,409	29,734	21,788
Mobile/Manuf. Homes	4,636	4,462	5,301	3,737	2,452
TOTAL	44,922	52,400	67,710	33,471	24,240
Pinellas County					
Site-built Homes	153,436	130,087	124,181	94,025	51,953
Mobile/Manuf. Homes	2,789	6,407	8,335	8,814	1,561
TOTAL	156,225	136,494	132,516	102,839	53,514

Note: Vulnerable population determined using SRESP behavioral data and county provided evacuation zones. Vulnerable population numbers are not inclusive, meaning population numbers listed for a higher zone are not included in the lower zone. For example, vulnerable population listed for Evacuation Zone B does not include vulnerable population listed for Evacuation Zone A.

Critical Facilities Geodatabase

- Health Care Facilities
- Utilities Infrastructure (Water, Waste Water, Solid Waste)
- Law Enforcement, Fire, EMS, Schools and Shelters
- Hazardous Material Facilities
- Community Centers, Public Buildings, etc.
- Transportation (Airports, Ports, Heliports)
- Communications
- Energy
- PODs, LSAs
- Military



V. Regional Shelter Analysis

- Shelter criteria
- Risk shelter capacity and demand
- Pet Shelters
- Special Needs Shelters



Shelter Capacity and Demand

Table V-9
Public Shelter Demand for Hurricane Evacuation
Base Scenarios 2010

Evacuation Level	Hillsborough	Manatee	Pasco	Pinellas	Region
Capacity ⁹	56,737	26,760	28,285	22,166	133,948
A	15,547	7,061	15,078	22,892	60,578
B	19,185	9,187	16,744	28,795	73,911
C	25,787	12,153	23,449	37,063	98,451
D	35,921	17,551	26,005	43,849	123,327
E	49,641	21,634	28,137	49,806	149,217

Numbers in Red represent a shelter deficit.

VI. Evacuation Transportation Analysis

- Existing and Future Networks
- Base and Operational Scenarios
- Clearance Times
 - To Shelter
 - In-County
 - Out-of-County
 - Regional



Clearance Time Definitions

- Clearance Time to Shelter
- In-County Clearance Time
- Out of County Clearance Time
- Regional Clearance Time

Clearance Time to Shelter - The time necessary to safely evacuate vulnerable residents and visitors to a "point of safety" within the county based on a specific hazard, behavioral assumptions and evacuation scenario. Calculated from the point in time when the evacuation order is given to the point in time when the last vehicle reaches a point of safety within the county. Key points to remember for clearance time to shelter include:

- All in-county trips reach their destination within the county; and,
- This definition does not include any out of county trips.

In-County Clearance Time - The time required from the point an evacuation order is given until the last evacuee can either leave the evacuation zone or arrive at safe shelter within the county. This does not include those evacuees leaving the county on their own. Key points to remember for in-county clearance time include:

- All in-county trips reach their destination within the county;
- All out of county trips exit the evacuation zone, but may still be located in the county; and,
- This definition does not include out-of-county pass-through trips from adjacent counties, unless they evacuate through an evacuation zone.

Out of County Clearance Time - The time necessary to safely evacuate vulnerable residents and visitors to a "point of safety" within the county based on a specific hazard, behavioral assumptions and evacuation scenario. Calculated from the point an evacuation order is given to the point in time when the last vehicle assigned an external destination exits the county. Key points to remember for out of county clearance time include:

- The roadway network within the county is clear;
- All out of county trips exit the county, including out of county pass-through trips from adjacent counties; and,
- All in-county trips reach their destination.

Regional Clearance Time - The time necessary to safely evacuate vulnerable residents and visitors to a "point of safety" within the (RPC) region based on a specific hazard, behavioral assumptions and evacuation scenario. Calculated from last vehicle assigned an external destination exits the region. Key points to remember for regional clearance time include:

- The roadway network within the RPC is clear;
- All out of county trips exit the RPC, including out of county pass-through trips from adjacent counties;
- All in-county trips reach their destination; and,
- Regional clearance time is equal to the largest out of county clearance time for a given scenario for any of the counties within the RPC, since the out of county clearance time includes out of county pass through trips from adjacent counties.

New Clearance Times - 2010

Table VI-11 2010 Clearance Times for Base Scenario

	Evacuation Level A Base Scenario	Evacuation Level B Base Scenario	Evacuation Level C Base Scenario	Evacuation Level D Base Scenario	Evacuation Level E Base Scenario
Clearance Time to Shelter					
Hillsborough	15.5	22.0	29.5	39.0	59.5
Manatee	12.5	12.5	17.0	20.5	34.0
Pasco	14.0	18.0	33.5	49.5	60.0
Pinellas	13.0	13.0	18.5	22.5	41.0
In-County Clearance Time					
Hillsborough	15.5	22.0	29.5	39.0	59.5
Manatee	13.5	14.0	19.0	33.0	40.0
Pasco	14.0	18.0	33.5	49.5	60.0
Pinellas	13.0	13.5	18.5	24.0	43.0
Out of County Clearance Time					
Hillsborough	16.5	23.0	29.5	47.0	59.5
Manatee	14.5	14.5	19.5	33.0	45.5
Pasco	17.0	22.0	36.0	54.5	60.5
Pinellas	14.0	13.5	18.5	24.0	43.0
Regional Clearance Time					
Tampa Bay Region	16.5	23.0	36.0	54.5	60.5

New Tool to Measure Impacts



- The Transportation Interface for Modeling Evacuations (TIME) is the tool used to run future scenarios.
- Built on the Cube Voyager & Cube Avenue software, this interface allows planners to run variations of the transportation scenario.

New Tool to Measure Impacts



- Adjust the scenario to increase or decrease population, roadway capacities, and shelter availability.
- Measure the variations to determine impacts of population or infrastructure changes.

Comprehensive Planning and Growth Management Implications

The Regional Evacuation Study Identifies:

1. Coastal High Hazard Area
2. Hurricane Vulnerability Zone
3. Evacuation Clearance Times
4. Shelter Capacity

Policy Responsibilities for the CHHA

- Limit public expenditure that subsidize development
- Direct population concentrations away
- Limit development within CHHA
- Maintain or reduce hurricane evacuation clearance times
- Rule 9J-5.012(3)(b)5., 6., and 7., F.A.C.; and Rule 9J-5.016(3)(b)2., F.A.C.

Developments of Regional Impact and Shelter Capacity

DRIs have a substantial regional impact on public hurricane shelter space availability if:

- Anticipated impact will require 200+ spaces in an area with an existing shelter deficit.
- The development would move the county into a deficit situation of 200+ spaces.
- Located in a Hurricane Vulnerability Zone and would utilize 25%+ of a hurricane route's capacity.
- Therefore, impacts must be through mitigation.

Rule 9J-2.0256(4), F.A.C.

Release of Study

- Regional Evacuation Study becomes effective upon approval and release by the Florida Division of Emergency Management
- Upon release by DEM, the Study will be best available data and professionally acceptable analysis for the purposes of Growth Management

Official Release

August 26, 2010
10:00 a.m.

Tampa Bay Regional
Planning Council

www.tbrpc.org



Tampa Bay Catastrophic Plan



The Scenario



Hurricane *Phoenix*

➤ The SLOSH Run

- New SLOSH basin
- Large, category 5 on a NE track hitting north of the mouth of the bay
- Maximize storm surge in bay and along the coast
- Maximize impact of severe winds to all 9 counties



The Impacts



- Using HAZUS to determine impacts
 - Structures impacted (# and %)
 - Debris
 - Critical Facilities
 - Hospitals, Nursing homes, EOCs, Fire and Police stations
 - Critical Infrastructure
 - Water, Waste Water
 - Power and Communications
 - Transportation
 - Fuel



Social & Economic Impacts

- Impact to Employees
 - including responders and critical employees
- Health Care System
- Additional Economic Impacts
 - Work Place Damage and Business Interruption
 - Workforce
 - Loss of Key Assets: Ports, Airports
 - Impacts to tourism, agriculture



Work Groups

- Emergency Management
- Emergency Response
- Critical Infrastructure/
Public Works
- Public Information
- Disaster Housing
- Economic Restoration
- Animal Issues
- Humans Services
- Health and Medical
- Environmental Restoration

Catastrophic Planning

- Regional Planning
 - Resources & Priorities
 - Coordination
 - Gaps!
 - Consistency
 - Recognizing State and Local Roles
 - Recognizing Other Critical Partners including the Private Sector
 - Innovation
- 

For More Information

Betti C. Johnson, AICP
Emergency Management

Tampa Bay Regional Planning Council
4000 Gateway Centre Blvd., Suite 100
Pinellas Park, FL 33782

www.tampabaycatplan.org

Betti@tbrpc.org



Questions?

