IV. STRATEGY FOR PUBLIC SHELTER DEFICIT REDUCTION

The Division is statutorily responsible for developing a strategy to eliminate the deficit of “safe” public hurricane shelter space in Florida. See Secs. 252.35(2)(a)2 and 252.385(1), (2) and (3), Florida Statutes. The Division’s strategy includes the following components:

Component 1 – Develop and Implement Model Selection Guidelines

The Division is responsible for administering a survey program of existing schools, universities, community colleges, and other state, county and municipally-owned public buildings. The Division is also responsible for annually providing a list of facilities recommended to be retrofitted using state funds. To accomplish these tasks, the Division recognized the American Red Cross’s Standards for Hurricane Evacuation Shelter Selection (ARC 4496, 2002) as minimum safety criteria; See Appendix C. ARC 4496 provides safety criteria for storm surge, rainfall flooding and wind hazards, plus a basic least-risk decision making process. However, to apply the criteria to field conditions and typical building stocks, the Division expanded its interpretation of ARC 4496 into a prescriptive least-risk decision making model. The model is qualitative and based largely upon building performance assessments following Hurricane Andrew (e.g., give preference to building qualities, or characteristics, that performed well in Hurricane Andrew, and avoid (or mitigate) those that performed poorly.). A condensed version of the model can be viewed at the following URL address:

http://www.floridadisaster.org/Response/engineers/HES/Manual/ARC4496-Prescriptve-Summary-Table.pdf

Component 2 – Implement Shelter Survey Program

To date, the Division has completed the first statewide baseline survey, and initiated a second baseline survey to improve accuracy of the statewide inventory. The results of the surveys are used by state and local agencies to prepare and implement strategies to reduce, and ultimately eliminate, the deficit of recognized ARC 4496 hurricane shelter space. Between 1999 and 2014, over 4,955 buildings were surveyed utilizing State surveyors and private-sector consultants. The survey program has not only identified about 66,823 “as-is” spaces, but also directly, or in some cases indirectly, led to creation of more than 411,582 retrofitted shelter spaces. These totals combined with the EHPA construction of 506,621 spaces results in a total capacity of 985,025 spaces for this period. Projections provided in Table 2.1 indicate an additional 20,511 spaces will be online by August 2015.

Component 3 – Retrofit appropriate facilities to meet Guidelines

Since 1999, the State Legislature has annually provided funds for retrofit projects listed in the annual Shelter Retrofit Report. The retrofit projects are identified through the survey program, and are only recommended when the retrofit can create spaces that meet ARC 4496.
For Fiscal Year 2014-2015, the State Legislature appropriated $3 million to structurally enhance or retrofit public hurricane evacuation shelters. Preliminary estimates are about 16,539 spaces to be created with these funds.

**Component 4 – New construction of public school facilities as Shelters**

Florida Department of Education (FDOE) appointed a committee to develop a public shelter design criteria for use in new school facility construction projects. The committee included representatives from many stakeholder agencies (e.g., state and local emergency management, school board, community college and university officials, ARC, architects, engineers, etc.). The charge to the committee was to develop a set of practical and cost-effective design criteria to ensure that appropriate new educational facilities can serve as public shelters for emergency management purposes. The final criterion recommended by the committee was consistent with the hurricane safety criteria of ARC 4496.

The recommended wind design criterion was the American Society of Civil Engineers Standard 7 (ASCE 7) with a 40 mile per hour increase in basic map wind speed and an importance factor I=1.00. In addition, the hurricane shelter’s exterior envelope (walls, roofs, windows, doors, louvers, etc.) must all meet a basic wind-borne debris impact standard (i.e., SSTD 12; 9lb 2x4 @ 34 mph). However, school board officials successfully protested the increase in base wind speed, so the minimum wind design criterion was reduced to ASCE 7 at basic map wind speed with an essential facility importance factor I=1.15. The 40 mile per hour increase in base wind speed is still recommended within the code, but not required. The criteria were promulgated into the State Requirements for Educational Facilities in April, 1997. The Division’s model hurricane shelter evaluation criteria’s preferred rankings were adjusted to be consistent with FDOE’s public shelter design criteria (also known as the Enhanced Hurricane Protection Area or EHPA criteria).

Schools are funded primarily by state and local capital outlay funds, and school districts are generally reporting that the EHPA construction cost premium is about three to six percent. Since 1997, EHPA construction has created about 506,621 (Table 2.1) spaces, which accounts for about 52 percent of the statewide ARC 4496 space inventory.

**Component 5 – Shelter demand reduction through improved public information and education and through decreased evacuation**

Hurricane evacuation studies have generally indicated that at least 25 percent of a vulnerable population would seek public shelter during an evacuation event. However, recent studies indicate that only about 15 percent will actually seek public shelter. This is consistent with the findings of recent post-storm assessments that indicate less than 10 percent of vulnerable populations seek public shelter.

The public shelter demand resulting from hurricane evacuation has been significantly reduced over the past 11 years due to improvements in public education and information, and more accurate storm surge/evacuation zone modeling with the use of the LiDAR (Light...
Detection and Ranging). The 2010 Statewide Regional Evacuation Studies (SRES) resulted in a statewide aggregate hurricane evacuation shelter space demand reduction of 604,792 spaces. Florida’s projected statewide hurricane evacuation shelter space demand for 2014 is 886,541.

**Statewide Progress in Shelter Deficit Reduction**

Since 1995, Florida has made significant progress toward improving the safety and availability of public hurricane shelter space. This has been accomplished through a comprehensive strategy of surveys, retrofitting, new construction, evacuation studies and public education. An expansion in storm surge/evacuation zones, decommissioned buildings and changes in Planned Local Use has resulted in an approximate decrease in overall space of nearly 20 percent. These reductions are difficult when the State of Florida has made so much progress in increasing the Overall State Capacity, but remain necessary to ensure the safety of public hurricane shelter space. Improved modeling also has its benefits which is a reduction of the estimated total shelter demand by more than 44 percent. There now is a demonstrable adequate capacity of public hurricane shelter space in 37 counties. The statewide cumulative deficit of hurricane shelter space has been eliminated yet regions 4, 5, and 9 remain in a deficit condition.

Figure 4.1. Graph of Florida’s progress in reducing the hurricane shelter deficit