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 ss. 252.35(2)(a)2 and 252.385(1) and (2), 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’ Standards for Hurricane Evacuation Shelter Selection (ARC 4496) as a 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/CheatSheet-5-9-2003.pdf.

Component 2 – Implement Shelter Survey Program

To date, the Division has completed the first statewide baseline survey, and initiated a second baseline survey. 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 ARC 4496 shelter space. Between 1998 and 2009, over 3,600 buildings were surveyed utilizing State surveyors and consultants. The survey program has not only identified about 46,747 “as-is” spaces, but also directly, or in some cases indirectly, led to creation of more than 448,996 retrofitted shelter spaces.

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 2006-2007, the State Legislature appropriated up to $15 million to structurally enhance or retrofit public hurricane evacuation shelters. See House Bill 7121 (Chapter 2006-71, Laws of Florida). Specific Appropriation 1621X (FY 07-08), provided $3
million in State funds for shelter retrofitting. A portion of these funds are being used to provide "Cash Match" for the HB7121 retrofit projects (See Appendix I). Currently, a total of 43 projects are ongoing/completed (expected to generate 26,766 spaces).

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 criteria 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 windborne 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).

Since 2001, where there was only about 65 percent compliance, EHPA shelter capacity increased from an average of 35,000 spaces per year, to 63,000 spaces being constructed for 2004. 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 527,099 spaces, which accounts for 51.5 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. Recent studies, however, 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.

Since 2000, Florida’s reported public hurricane shelter demand has been reduced by at least 540,200 spaces. This was accomplished through the use of more precise coastal mapping techniques, improved storm surge mapping, more accurate census data, and improvements in public education and hurricane evacuation study demand modeling. Under House Bill 7121, funds were provided to update all eleven (11) regional evacuation studies. As part of the process, new coastal LIDAR (Light Detection and Ranging) data will be gathered to update coastal surge/flood modeling tools. As a result of the improved accuracy of elevation/topographical data and modeling, it is expected that the overall shelter demand will diminish further. These studies are still being compiled at this time.

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. These aggressive initiatives have resulted in reducing the overall statewide shelter space deficit and creating a demonstrable surplus of public hurricane shelter spaces in twenty-three (23) counties. By about 2016, the statewide deficit of hurricane shelter space may be eliminated. See Figure 4.1.
Figure 4.1. Graph of Florida’s progress in reducing the hurricane shelter deficit

Hurricane Shelter Status