EXECUTIVE SUMMARY

Since 1992, Florida has been impacted by 14 hurricanes, seven of which were major hurricanes. Hurricane shelter surveys and regional evacuation studies have determined that there are hurricane shelter space deficits in many regions. Though there has been significant progress in reducing the deficit, school boards and other partners continue to need guidance to best utilize available resources.

Pursuant to ss. 1013.372(2) and 252.385(2)(b), Florida Statutes, the Division of Emergency Management (Division) is responsible for preparing a *Statewide Emergency Shelter Plan* (the Plan). The Plan is a guide for local hurricane shelter planning. It also provides consultative assistance to school districts contemplating construction of educational facilities and the need to provide public shelter space within those facilities. The Plan is submitted to the Governor and Cabinet for approval by January 31 of each even-numbered year. The Plan identifies the general location and square footage of both general population and special needs shelters, by regional planning council region, during the next five (5) years. The Plan must include information on the availability of shelters that accept pets. The Department of Health must also assist the Division in determining the estimated need for special needs shelter space and the adequacy of facilities to meet the needs of persons with special needs based on information from the registries of persons with special needs and other information. In accordance with the statute, the Plan must:

- Identify the general location and square footage of existing shelters by Regional Planning Council regions;
- Identify the general location and square footage of needed shelters by Regional Planning Council regions for the next five years;
- Identify the types of facilities which should be constructed to comply with the public shelter design criteria; and
- Recommend an appropriate and available source of funding for the additional cost of constructing emergency shelters within those public facilities.

Table EX-1 provides a regional summary of the projected regional hurricane shelter space demands between 2010 and 2015 and indicates whether or not there is a surplus or deficit in the region. At this time, five (5) RPC regions have a surplus of hurricane shelter space in 2010 (West Florida/Region 1, Apalachee/Region 2, East Central Florida/Region 6, Treasure Coast/Region 10 and South Florida/Region 11). Based upon currently available information, surpluses will continue in these regions through 2015. All other regions have hurricane shelter space deficits, and their respective district school boards, community colleges and universities are required to construct all new educational facilities in accordance with public shelter design criteria.

Table EX-1.
Regional Summaries of Hurricane Shelter Demand, Capacities, and Deficits/Surpluses for 2010 through 2015
General Population and Special Needs Shelters

RPC Region	RPC Region Name	General Population Shelter Demand and Capacities					Special Needs Shelter Demand and Capacities				
		2010 Cat. 5 Shelter Demand, persons	2015 Cat. 5 Shelter Demand, persons	2010 Shelter Capacity, persons	2010 Shelter Surplus/ (Deficit), persons	2015 Shelter Surplus/ (Deficit), persons	2010 Cat. 5 Shelter Demand, clients	2015 Cat. 5 Shelter Demand, clients	2010 Shelter Capacity, clients	2010 Shelter Surplus/ (Deficit), clients	2015 Shelter Surplus/ (Deficit), clients
1	West Florida (WF)	57,045	60,453	73,897	16,852	13,444	3,171	3,336	2,460	(711)	(876)
2	Apalachee (APAL)	22,507	23,580	33,568	11,061	9,988	1,041	1,091	814	(227)	(277)
3	North Central Florida (NCF)	37,064	39,246	32,683	(4,381)	(6,563)	3,115	3,392	1,189	(1,926)	(2,203)
4	Northeast Florida (NEF)	124,420	134,773	73,297	(51,123)	(61,476)	3,995	4,431	3,725	(270)	(706)
5	Withlacoochee (WITH)	48,154	53,245	29,258	(18,896)	(23,987)	3,971	4,399	1,760	(2,211)	(2,639)
6	East Central Florida (ECF)	95,059	109,034	161,863	66,804	52,829	7,975	8,818	7,878	(97)	(940)
7	Central Florida (CF)	191,285	209,840	60,304	(130,981)	(149,536)	4,278	4,624	1,440	(2,838)	(3,184)
8	Tampa Bay (TB)	339,058	370,186	222,362	(116,696)	(147,824)	13,536	14,167	6,833	(6,703)	(7,334)
9	Southwest Florida (SWF)	278,462	319,775	116,221	(162,241)	(203,554)	6,844	7,457	6,142	(702)	(1,315)
10	Treasure Coast (TC)	70,732	79,948	105,655	34,923	25,707	1,830	1,987	3,110	1,280	1,123
11	South Florida (SF)	124,804	133,045	164,197	39,393	31,152	1,465	1,515	4,402	2,937	2,887
	TOTALS	1,388,590	1,533,125	1,073,305	(315,285)	(459,820)	51,221	55,217	39,753	(11,468)	(15,464)

With publication of the 2010 Plan, the Division is also monitoring the status of the statewide inventory of Special Needs Shelters (SpNS). Historically, SpNS's have been included in total population hurricane shelter demand estimates, hurricane shelter capacities and surplus/deficit results. Given the findings from the 2004 hurricane season where about half of the designated SpNS's were located in facilities that did not meet the same minimum hurricane safety criteria as general population shelters, the Division was asked to separate the two shelter types (general population and special-needs) and monitor progress towards improving SpNS hurricane safety, client capacity and provision of emergency power supported air-conditioning. As demonstrated in Table EX-1, nine (9) regions currently have client space deficits.

The types of public facilities that should be constructed to comply with the public shelter design criteria include all facilities that are subject to be used as public hurricane shelters under the authority of section 252.385(4)(a), Florida Statutes; that is, public schools, community colleges, universities, and other facilities owned by state and local governments. When appropriately located, designed and constructed, the following types of facilities are normally considered suitable for use as public hurricane shelters:

> Community and civic centers, meeting halls, gymnasiums, auditoriums, cafeterias and open floor multipurpose facilities, exhibition halls, sports arenas, field houses, conference and training centers, certain classroom buildings, and other public assembly facilities.

There are only so many types of facilities that can be used as public shelters. Those types of facilities that are not appropriate for use as public shelters are due to the following elements:

- location (facilities within Category 1, 2 or 3 hurricane evacuation zones, and possibly Category 4 and 5, flooding isolation, presence of certain hazardous materials, low evacuation demand, etc.),
- size (e.g., less than 2,000 square feet of usable floor area, etc.), or
- other characteristics (incompatibility of facility's normal use or availability with mass care function, long-range planning considerations, etc.).

District school boards have generally been reporting that the construction cost premium for incorporating the criteria is about three (3) to six (6) percent (%). This is a relatively small, but not necessarily insignificant, cost that must be borne by state and local agencies. Therefore, s. 1013.372(2), F.S. requires that the Division recommend an appropriate and available source of funding for the additional cost of constructing emergency shelters. The Division recommends use of existing state capital outlay funds since there is no dedicated state source of funding to support new hurricane shelter construction.

The Public Education Construction Outlay (PECO) is the only existing state capital outlay fund, available to support new hurricane shelter construction. PECO funds are earmarked for site acquisition and improvements necessary to accommodate buildings, equipment, and other structures of district school boards, community colleges and universities. The Department of Education has distributed about $1,877,969,362 in

new construction funds to district school boards since promulgation of the public shelter requirement into code in 1997. Other state sources of school construction funding have included General Revenue and Lottery funds. From time to time, Federal and State mitigation-related funds may be available to support the construction cost premium for improving hurricane resistance **above** minimum code requirements for new facilities. However, the mitigation funds are not considered normally "available" for most new construction projects, since their grant cycles are often associated with disaster declarations.

The Division has statutory responsibility and authority to administer a statewide program to eliminate the deficit of "safe" hurricane shelter space. To ensure consistency with state and national standards, guidelines and "best practices," the Division has recognized *Standards for Hurricane Evacuation Shelter Selection* (ARC 4496) as the minimum hurricane shelter survey and evaluation criteria. Therefore, at a minimum, meeting ARC 4496 criteria is a required condition for a public facility to be described as "safe", "suitable" or "appropriate" for use as a public hurricane shelter.

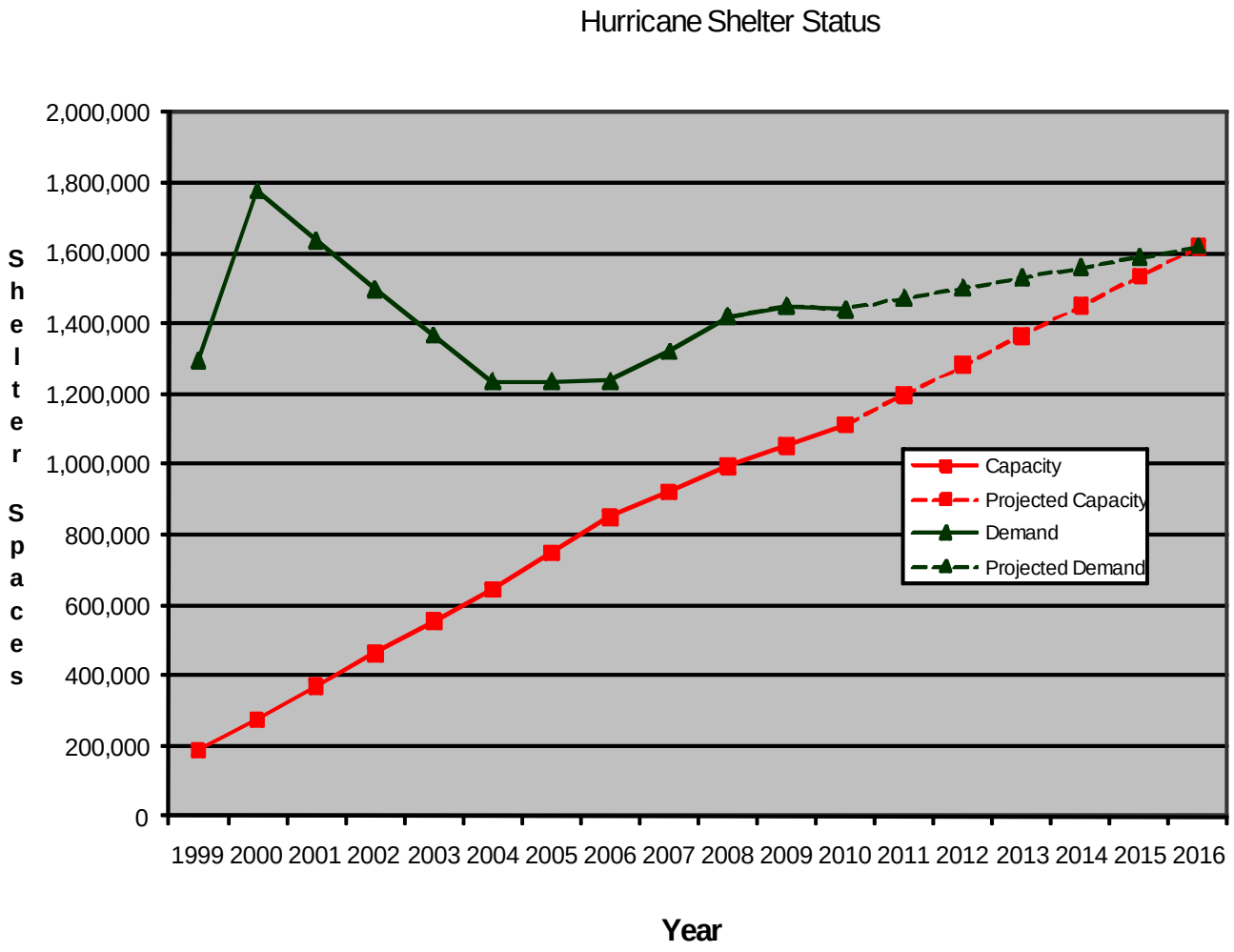
To accomplish this objective, the Division has implemented a multifaceted program. This program includes: 1) survey of existing buildings, both public and private, to identify suitable shelter capacity; 2) where cost effective (and practical), support mitigation and retrofitting of existing facilities to increase shelter capacity; 3) construction of new facilities to meet the public shelter design criteria; 4) shelter demand reduction through improved hurricane hazard models and behavioral studies; and 5) improve public information/education to reduce unnecessary "shadow" evacuations.

Since 1995, the Division's hurricane shelter survey and retrofit program has identified, created or otherwise documented 538,425 hurricane shelter spaces that meet ARC 4496 guidelines. Public school new construction programs have created an additional 574,633 hurricane shelter spaces. Therefore, by the 2010 hurricane season, Florida will have a total of 1,113,058 shelter spaces that meet ARC 4496 guidelines. The demand for hurricane shelter space has also been significantly reduced over the past seven years due to improvements in public information, storm hazard models and more accurate census data. Since 2000, Florida's deficit of hurricane shelter space has been reduced by 72 percent, and based on current trends the Division estimates that about 84,000 spaces will be added to the state's inventory each year. As demonstrated in Figure EX-1, the Division estimates that the hurricane shelter space deficit may be eliminated by 2016.

Since publication of the *2000 Statewide Emergency Shelter Plan*, Florida now has 28 counties with demonstrable surpluses of hurricane shelter space. The counties with surpluses include: Bay, Brevard, Broward, Escambia, Gadsden, Gilchrist, Hardee, Hernando, Highlands, Indian River, Lake, Leon, Liberty, Madison, Manatee, Martin, Miami-Dade, Okaloosa, Orange, Osceola, Palm Beach, St. Johns, St. Lucie, Santa Rosa, Seminole, Taylor, Walton, and Washington. Also, five RPC regions have a demonstrable surplus of hurricane shelter space (West Florida/Region 1, Apalachee/Region 2, East Central Florida/Region 6, Treasure Coast/Region 10, and South Florida/Region 11).

Florida's hurricane shelter space deficit situation has significantly improved since the 1990's. The overall result of full implementation of the Division's shelter deficit reduction strategy is a greater level of preparedness, a more efficient capability for responding to incidents and a greater ability to meet the needs of disaster survivors.

Figure EX-1. Projected Hurricane Shelter Deficit Reduction



1.0 INTRODUCTION

1.1 Purpose of Statewide Emergency Shelter Plan

Pursuant to section 1013.372(2), and Section 252.385(2)(b), Florida Statutes (F.S.), the *Statewide Emergency Shelter Plan* (Plan), is prepared and submitted to the Governor and Cabinet for approval. The Plan provides information on existing and long-term hurricane evacuation shelter space requirements. This information is then used by district school boards, community college boards of trustees, university boards of trustees and emergency management agencies in planning for the construction of new educational facilities to comply with the public shelter design criteria. "Board," unless otherwise specified, means a district school board, a community college board of trustees, and a university board of trustees.

This Plan, once approved, will determine which regions and counties are required to construct new educational facilities to comply with the public shelter design criteria. The Plan includes: the general location and square footage of existing general population and special needs shelters by region and county; the general location and square footage of needed general population and special needs shelters by region and county for the next five years; the types of facilities that should comply with the public shelter design criteria; and recommends an appropriate and available source of funding for the additional cost of constructing public hurricane shelters in those public facilities.

Since promulgation of the public shelter design criteria in 1997, the Division has routinely received requests for guidance on certain aspects of the criteria. Therefore, this Plan also includes consultative guidance by the Division on subjects relating to implementation of the criteria; such as, minimum mass care/human needs requirements not specified in the code, explanation of exemption criteria, etc. The guidance is not intended to be a comprehensive commentary of the criteria, but is limited to subjects pertinent to the most frequently asked questions. This Plan also includes a brief progress report of statewide hurricane shelter space deficit elimination.

1.2 Background and Chronology

On August 24, 1992, Hurricane Andrew made landfall in South Florida as a Category 5 hurricane. Winds in excess of 155 miles per hour spread inland, causing catastrophic damage in and about Miami-Dade County. It has been estimated that 750,000 persons heeded appropriate warnings and evacuated coastal areas, inland flood prone areas and manufactured homes. In some cases, spontaneous (or “shadow”) evacuation of persons outside of areas ordered to evacuate also occurred. Though many evacuees sought shelter in motels or the homes of family and friends, many also sought safety in public shelter facilities in the affected area, and in communities along evacuation routes throughout the state. This unprecedented relocation of Florida’s residents and visitors in the face of an impending natural disaster stretched the resources of State, local, and private agencies to provide public shelter.

Post-disaster evaluations of evacuation and sheltering operations by the *Governor's Disaster Planning and Response Review Committee*, also known as the "Lewis Commission Report," identified the lack of adequate and appropriate public shelter space as a critical planning issue. The Lewis Commission Report served as the driving force behind the adoption of Chapter 93-211, Laws of Florida, and subsequent revisions to Chapters 235, 240 and 252, Florida Statutes. The educational facilities sections of Chapters 235 and 240 have been superseded by Chapter 1013. Based on those revisions, the Legislature stated its intent that Florida eliminate its deficit of safe public hurricane shelter space in any region of the State.

In consultation with county Boards of Commissioners, county emergency management offices and the Division of Emergency Management, the State mandated that the Department of Education develop standards for a public shelter design criteria. These criteria were incorporated into State Requirements for Educational Facilities (SREF). The new criteria were to be designed to ensure that appropriate new educational facilities can serve as public shelters for emergency management purposes. After promulgation of the criteria, all new educational facilities, or appropriate areas within facilities, for which a design contract was entered into after the effective date of the inclusion of the public shelter criteria in SREF, must be built in compliance with the criteria, unless the facility is exempted by the applicable local emergency management agency or the Division.

The Department of Education entered into a contract with the University of Florida, School of Building Construction, to prepare the shelter design criteria. The university assembled an advisory committee consisting of members from federal, state and local emergency management agencies, architects, engineers, academia, district school boards and the American Red Cross (ARC). The task before the advisory committee was to develop criteria that balanced the need to provide a relatively safe and self-sufficient facility, with the need for cost-effective designs and construction methods.

The advisory committee incorporated not only its collective knowledge, experience and existing national codes and standards, but also consulted with Texas Tech and Clemson Universities for severe storm research findings, and with relevant publications, such as the American Red Cross' *Mass Care—Preparedness and Operations* (ARC 3031, superseded by ARC 3041), *Guidelines for Hurricane Evacuation Shelter Selection* (ARC 4496), and the Department of Energy's (DOE) Standard *Natural Phenomena Hazards Design and Evaluation Criteria* (DOE-STD-1020).

The product of this process is a set of comprehensive design criteria that includes structural enhancements, potable water and sanitary requirements, provisions for emergency power, and other considerations that improve survivability and shelter management operations. The promulgation process began in 1994, and was finally adopted into SREF on April 28, 1997. Subsequently, along with other sections of SREF, the criteria were incorporated in Chapter 423 of the Florida Building Code, which became effective March 1, 2002. This provided a seamless continuation of the criteria for new school construction projects. The public shelter design criteria code provisions in effect at the time of publication of this Plan can be seen in Appendix B.

The public shelter program lessons learned from Hurricane Andrew were further reiterated during the 2004 and 2005 hurricane seasons. During these two seasons alone, approximately 15 million people in Florida were under evacuation orders from eight (8) hurricanes and two (2) tropical storms. During 2004 and 2005, nearly every county in Florida was under hurricane or inland high wind warnings, prompting mandatory evacuation orders for their coastal storm surge, inland flood vulnerable and manufactured home residents. More than a thousand shelters were opened, which safely protected more than 410,600 evacuees.

Clearly in a large-scale emergency, the availability of shelter space is a statewide challenge. Even, if some individual counties have surplus shelter space, deficits in others counties will have statewide implications that will have to be addressed. Evacuees that cannot find shelter space within their own county or region will leave those areas in search of viable shelter alternatives elsewhere. Thus, implementation and enforcement of the public shelter design criteria in new educational facilities is a critical component of Florida's hurricane shelter space deficit elimination program.

1.3 Statutory Considerations

There are several statutory authorities that are applicable for implementation of the public shelter design criteria. The following statutes have been selected to provide context for decisions relating to planning and exemption of educational facilities.

252.38 Emergency management powers of political subdivisions.--
Safeguarding the life and property of its citizens is an innate responsibility of the governing body of each political subdivision of the state.

(1) COUNTIES.--

(d) During a declared state or local emergency and upon the request of the director of a local emergency management agency, the district school board or school boards in the affected area shall participate in emergency management by providing facilities and necessary personnel to staff such facilities. Each school board providing transportation assistance in an emergency evacuation shall coordinate the use of its vehicles and personnel with the local emergency management agency.

Section 252.38, F.S. provides that "Safeguarding the life and property of its citizens is an innate responsibility of the governing body of each political subdivision of the state." This places the burden for evacuating and sheltering at-risk citizens during an emergency or disaster upon county governing boards (i.e., Board of County Commissioners). To expand and expedite locally available resources to meet an emergency need, the Legislature directed that during a declared state or local emergency, district boards will upon request participate in emergency management by providing facilities, personnel, equipment and vehicles.

District public schools are the primary source of public shelter during emergencies, currently accounting for about 96 percent of statewide hurricane shelter

space. Therefore, it can be presumed that public schools will be used as hurricane shelters, and often staffed by district personnel. It can also be presumed that public schools will be opened as shelters regardless of the storm's forecasted intensity and track. Therefore, it is critical that new school facilities be appropriately designed and located to serve the required emergency function.

252.385 Public shelter space.--

(1) It is the intent of the Legislature that this state not have a deficit of safe public hurricane evacuation shelter space in any region of the state by 1998 and thereafter.

(2)(a) The division shall administer a program to survey existing schools, universities, community colleges, and other state-owned, municipally owned, and county-owned public buildings and any private facility that the owner, in writing, agrees to provide for use as a public hurricane evacuation shelter to identify those that are appropriately designed and located to serve as such shelters. The owners of the facilities must be given the opportunity to participate in the surveys. The state university board of trustees, district school boards, community college boards of trustees, and the Department of Education are responsible for coordinating and implementing the survey of public schools, universities, and community colleges with the division or the local emergency management agency.

(b) By January 31 of each even-numbered year, the division shall prepare and submit a statewide emergency shelter plan to the Governor and Cabinet for approval, subject to the requirements for approval in s. 1013.37(2). The plan shall identify the general location and square footage of special needs shelters, by regional planning council region, during the next 5 years. The plan shall also include information on the availability of shelters that accept pets. The Department of Health shall assist the division in determining the estimated need for special needs shelter space and the adequacy of facilities to meet the needs of persons with special needs based on information from the registries of persons with special needs and other information.

(4)(a) Public facilities, including schools, postsecondary education facilities, and other facilities owned or leased by the state or local governments, but excluding hospitals, hospice care facilities, assisted living facilities, and nursing homes, which are suitable for use as public hurricane evacuation shelters shall be made available at the request of the local emergency management agencies. The local emergency management agency shall coordinate with these entities to ensure that designated facilities are ready to activate prior to a specific hurricane or disaster. Such agencies shall coordinate with the appropriate school board, university, community college, state agency, or local governing board when requesting the use of such facilities as public hurricane evacuation shelters.

Section 252.385, F.S. states the intent of the State Legislature to eliminate the deficit of "safe" public hurricane shelter space. The Division was given both the duty and authority to administer a statewide program to survey public facilities and identify those that are appropriately designed and located to serve as public shelters.

To ensure consistency with State and national standards, guidelines and "best practices," the Division has recognized ARC 4496 as the minimum hurricane shelter survey criteria. Therefore, at a minimum, meeting ARC 4496 criteria is a required

condition for a public facility to be described as "safe," "suitable" or "appropriate" for use as a public hurricane shelter. The public hurricane shelter capacities listed as "suitable" in this Plan are recognized by the Division as meeting ARC 4496 safety criteria. See Appendix A. Appendix A identifies the statewide inventory of facilities that meet ARC 4496 in their existing condition (i.e., "as-is"), facilities that have been retrofitted to meet ARC 4496, and facilities that have been constructed to meet ARC 4496. New school facilities that are reported by district school boards and local emergency management agencies as having been constructed to the public shelter design criteria are generally assumed by the Division to meet ARC 4496; storm surge flooding hazards may limit recognition to exiting storms only.

It should be noted that the Division does not certify, approve or designate hurricane shelters. Through its survey program, the Division provides data and assistance to local emergency managers, who then use the ARC 4496 criteria as one factor in the selection of shelters. In addition to the ARC 4496 ranking, local emergency managers consider other factors in the selection process, such as, type of event requiring sheltering (known or perceived hazards and risks), location, available staffing resources, internal/external movement circulation, availability of adequate toilets and sanitation, feeding capabilities, standby or emergency power, types of spaces available and their configuration and contents, type and condition of roof covering, etc. When anticipated demand exceeds available ARC 4496 shelter space capacity, local emergency managers may select other facilities that afford the best available protection.

With the amendment of s. 252.385(2)(b), F.S. in 2006, the Plan is required to include information on the availability of pet-friendly public shelters as well as capacity of special needs shelters. The Department of Health is required to assist in determining need for special needs shelters.

As mentioned above, s. 252.385(4)(a) makes available all suitable public facilities owned or leased by state or local government agencies upon request of the applicable local emergency management agency. This broadens the types of facilities that can be used by emergency management officials in a declared emergency, and is consistent with the Division's authority to survey all appropriate public facilities for use as public hurricane shelters.

1013.372 Education facilities as emergency shelters.--

(1) The Department of Education shall, in consultation with boards and county and state emergency management offices, include within the standards to be developed under this subsection public shelter design criteria to be incorporated into the Florida Building Code. The new criteria must be designed to ensure that appropriate new educational facilities can serve as public shelters for emergency management purposes. A facility, or an appropriate area within a facility, for which a design contract is entered into after the effective date of the inclusion of the public shelter criteria in the code must be built in compliance with the amended code unless the facility or a part of it is exempted from using the new shelter criteria due to its location, size, or other characteristics by the applicable board with the concurrence of the applicable local emergency management agency or the Department of Community Affairs. Any educational facility located or proposed to be located in an

identified category 1, 2, or 3 evacuation zone is not subject to the requirements of this subsection. If the regional planning council region in which the county is located does not have a hurricane evacuation shelter deficit, as determined by the Department of Community Affairs, educational facilities within the planning council region are not required to incorporate the public shelter criteria.

As directed by law, the Department of Education was required to develop criteria, in consultation with district boards and state and local emergency management offices, to ensure that appropriate new educational facilities can serve as public shelters for emergency management purposes. The criteria are required to be incorporated into the State Requirements for Educational Facilities (SREF) of the Florida Building Code (i.e., s. 423.25, Florida Building Code--Building), and all facilities for which a design contract is entered into after incorporation of the criteria into the code must be built in compliance with the criteria. The public shelter design criteria are applicable to both district school board and community college facilities, and became effective on April 28, 1997. These criteria were also codified into the Florida Building Code--Building on March 1, 2002.

Section 1013.372 allows a board to exempt a facility from the criteria if the location, size or other characteristics is inappropriate for use as a public shelter. A facility that is located, or proposed to be located, in a Regional Planning Council region that is determined by the Division to have a hurricane shelter surplus may also be exempted. **It is unlawful and a violation of the Florida Building Code for a board to exempt a new educational facility from the criteria without the written concurrence of the applicable local emergency management agency or the Division.**

1013.74 University authorization for fixed capital outlay projects.--

(4) The university board of trustees shall, in consultation with local and state emergency management agencies, assess existing facilities to identify the extent to which each campus has public hurricane evacuation shelter space. The board shall submit to the Governor and the Legislature by August 1 of each year a 5-year capital improvements program that identifies new or retrofitted facilities that will incorporate enhanced hurricane resistance standards and that can be used as public hurricane evacuation shelters. Enhanced hurricane resistance standards include fixed passive protection for window and door applications to provide mitigation protection, security protection with egress, and energy efficiencies that meet standards required in the 130-mile-per-hour wind zone areas. The board must also submit proposed facility retrofit projects to the Department of Community Affairs for assessment and inclusion in the annual report prepared in accordance with s. 252.385(3). Until a regional planning council region in which a campus is located has sufficient public hurricane evacuation shelter space, any campus building for which a design contract is entered into subsequent to July 1, 2001, and which has been identified by the board, with the concurrence of the local emergency management agency or the Department of Community Affairs, to be appropriate for use as a public hurricane evacuation shelter, must be constructed in accordance with public shelter standards.

Section 1013.74(4), F.S., provides state university boards of trustees statutory duties similar as those of district public schools and community colleges. State universities, in consultation with state and local emergency management agencies, are

directed to assess existing facilities to identify the extent to which each campus has public hurricane shelter space.

Each campus is then responsible for developing a five-year capital improvements program that identifies potential new and retrofitted facilities that can be used as public hurricane shelters. The statute indicates that the facilities will incorporate "enhanced hurricane resistance standards" and must be constructed in accordance with "public shelter standards," but does not specify the Florida Building Code's public shelter design criteria. The Division recommends use of the Florida Building Code's public shelter design criteria for university facilities that are appropriate for use as public shelters. All campus buildings for which a design contract is entered into after July 1, 2001 are required to be constructed to the standard.

The statute indicates that a university board of trustees may exempt a facility from the criteria with the concurrence of the applicable local emergency management agency or the Division. A facility that is proposed to be located in a Regional Planning Council region that is determined by the Division to have a hurricane shelter surplus may also be exempted. As with district school boards and community colleges, **it is unlawful for a university board of trustees to exempt a new campus facility from the criteria without the written concurrence of the applicable local emergency management agency or the Division.**

381.0303 Special Needs Shelters. --

(2)(d) Local emergency management agencies shall be responsible for the designation and operation of special needs shelters during times of emergency or disaster and the closure of the facilities following an emergency or disaster. The local health department and emergency management agency shall coordinate these efforts to ensure the appropriate designation and operation of special needs shelters. County health departments shall assist the local emergency management agency with regard to the management of medical services in special needs shelters.

Section 381.0303(2)(d), F.S., requires local emergency management agencies designate Special Needs Shelters (SpNS). The Department of Health (through County Health Departments) is given the duty to assist with managing the medical service needs of the clients.

The Division strongly recommends that any SpNS shelter designated by local emergency management agencies meet the ARC 4496 hurricane safety criteria, and preferably facilities that have been designed and constructed to the public shelter design criteria.

2.0 EDUCATIONAL FACILITIES AS EMERGENCY SHELTERS

The public shelter design criteria, which are also known as Enhanced Hurricane Protection Area (EHPA) criteria, were designed to ensure that appropriate new educational facilities can serve as public shelters for emergency management purposes. Public educational facilities primarily serve an educational purpose. During a declared state of emergency these facilities may function as a public shelter. The public shelter function is a lawfully authorized function, and during a declared state or local emergency can preempt normal educational functions. Therefore, consideration of the emergency management purpose is a critical component of the design of a new educational facility. The following sections will provide consultative guidance for implementing the criteria.

2.1 Public Shelter Design Criteria

The EHPA criteria ensure that new educational facilities meet or exceed applicable national design and construction standards, guidelines and "best practices." The EHPA criteria have been designed to significantly enhance occupant safety and building integrity. One of the main objectives of the EHPA is to ensure that these facilities continue to serve the public after exposure to a major hurricane.

It is highly recommended that prior to design that the facility owners, planners and designers incorporate the American Red Cross' ARC 4496 in the planning process for an EHPA. See Appendix C. ARC 4496 is the minimum hurricane shelter safety guideline used by the Division, American Red Cross and local emergency management officials for surveying, evaluating and designating public hurricane shelters. ARC 4496 can also be viewed at the following web address:

http://www.floridadisaster.org/Response/engineers/documents/newarc4496.pdf

ARC 4496 requires that public hurricane shelters be designed, constructed and certified as capable of withstanding wind loads according to the American Society of Civil Engineers Standard 7 (ASCE 7). The EHPA code provisions recommend increasing the design map wind speed by 40 miles per hour. The Division endorses this requirement, especially if the EHPA, for example, is constructed with tall exterior walls, long span lightweight roof systems, wide roof overhangs, located in open areas with minimal sheltering, which are particularly vulnerable to damage from severe winds.

Please review Appendix G for additional consultative (or advisory) guidance on design criteria, including wind and debris impact resistance, foundation and floor slab elevation, location and site requirements, shelter capacity, plumbing and sanitation, electrical and emergency power systems, emergency management considerations. There are other useful resources to be considered in the EHPA design process, such as: 1) International Code Council's *Standard on the Design and Construction of Storm Shelters* (ICC 500), 2) the Department of Energy's (DOE) Standard *Natural Phenomena Hazards Design and Evaluation Criteria* (DOE-STD-1020), and 3) the Federal Emergency

Management Agency's (FEMA) publication *Design and Construction Guidance for Community Safe Rooms* (FEMA 361).

Special-needs shelters are no different than general population shelters. They should meet the same hurricane safety criteria as general population shelters (ARC 4496 and other state and national public shelter design criteria). Following the 2004 hurricane season, the Governor, Division and the Department of Health issued a memorandum stating an expectation that SpNS's be located in facilities that at a minimum meet the ARC 4496 hurricane safety criteria, that SpNS client occupied areas have standby power supported air-conditioning, and that client shelter spaces be based on 60 square feet per client (20 square feet is used for general population shelter spaces). The 60 square feet of spaces includes an allowance for care-givers and medical equipment. For further guidance, please see the following memorandum dated June 6, 2005:

http://www.floridadisaster.org/documents/Agwunobi-Fugate%20SpNS%206-7-2005.pdf

This memorandum was in response to findings from the 2004 hurricane season that only about half of the designated SpNS's met the minimum hurricane safety criteria. For a summary report of the performance of SpNS's during the 2004 hurricane season and mitigative actions taken to improve operations, please see the 2005 *Special Needs Shelter Report (*June, 2005) at the following web address:

http://floridadisaster.org/documents/SpNS_Report.pdf

This situation has improved significantly since 2004, with more than 50,000 special needs client spaces recognized as meeting at least minimum ARC 4496 hurricane safety criteria. Many of these spaces also have standby generator supported air-conditioning.

2.2 Exemption Criteria

All new educational facilities must be designed and constructed to comply with the EHPA criteria unless specifically exempted by the board, with the written concurrence of the applicable local emergency management agency or the Division. See s.1013.372, F.S.

It is unlawful and a violation of the Florida Building Code for a board to exempt a new educational facility from the criteria without the written concurrence of the applicable local emergency management agency or the Division.

The fact that the EHPA criteria may increase the cost of construction of a facility, by itself, is not a factor that will be considered for an exemption by the Division. Cost of construction may only be considered as one of a number of factors when "selecting a facility" to be designed and constructed to meet the EHPA criteria. Selection may be based upon cost-effectiveness, greatest provision of shelter space, and other factors that enhance shelter utility.

The EHPA requirement applies to any building construction project that is "new construction," as defined in ss. 1013.01(14), F.S. and s. 423.5.8, Florida Building Code--Building; that is, any construction of a building or unit of a building in which the entire work is new, or an entirely new addition connected to an existing building. This includes replacement buildings and new buildings and additions constructed on existing campuses. The EHPA requirement also applies to reuse and prototype plans, since they are required to be code updated with each new project.

The EHPA requirement is not limited to rooms or spaces defined as "core facilities" in s. 1013.01(5), F.S. The statutory definition is intended for educational facilities purposes, and defines "core facilities" to be media centers, cafeterias, toilet facilities and circulation space (e.g., corridors, lobbies, etc.) Section 1013.372(1), F.S. states that "A facility, or an appropriate area within a facility…must be built in compliance with the (EHPA criteria) unless exempted." The statute does not limit EHPA's to "core facilities," but permits use of an entire facility, or appropriate areas within a facility.

Both the Florida Statutes and the Florida Building Code provide factors to consider in exempting an educational facility from complying with the criteria. The American Red Cross' publication *Standards for Hurricane Evacuation Shelter Selection* (ARC 4496) also provides supplemental guidance to consider in the exemption process. The following subsections provide consultative guidance when considering an exemption request.

2.2.1 Location.

In general, there are five factors to be considered when making an exemption request due to location: 1) location of the proposed EHPA site within an identified Category 1, 2 or 3 hurricane evacuation zone; 2) location subject to hurricane-related rainfall or storm surge flooding or isolation; 3) location on a coastal barrier island; 4) location within the evacuation zone of facilities that manufacture, use or store certain types and quantities of hazardous materials; and 5) low evacuation demand.

Category 1, 2 or 3 Evacuation Zone. New educational facilities located or proposed to be located in an identified Category 1, 2 or 3 hurricane evacuation zone are exempt from the EHPA criteria. "Hurricane Evacuation Zones" are areas designated to be evacuated for particular hurricane scenarios to protect an at-risk population from flooding. Evacuation zones are developed taking into consideration all populated areas having a serious risk of flooding, areas not subject to flooding but may be cut-off or completely surrounded or isolated by flooded areas, and the need to be easily communicated to the public.

Hurricane evacuation zones are applicable to coastal counties, and possibly counties adjacent to Lake Okeechobee. Hurricane evacuation zones include areas that are subject to storm surge inundation, as predicted by the National Weather Service's Sea, Lake and Overland Surges from Hurricanes (SLOSH) model. Category 1, 2 and 3

evacuation zones are subject to evacuation during land-falling major hurricanes, as well as paralleling and exiting major hurricanes.

Category 4 and 5 hurricanes are relatively uncommon events, and based upon the storm track (land-falling, paralleling or exiting), Category 4/5 hurricane evacuation zones may not be inundated by storm surge. Therefore, new educational facilities proposed to be located in Category 4/5 evacuation zones are not statutorily exempt from the EHPA criteria.

Also, to facilitate communication of evacuation orders to the public during an emergency, hurricane evacuation zones are normally established using geographic, jurisdictional or transportation/utility boundaries and landmarks that are known and readily identified by the local population. Therefore, hurricane evacuation zone boundaries may extend further inland than the SLOSH model's predicted inundation areas. New educational facilities proposed to be located in a Category 4/5 evacuation zone may in fact be outside of the SLOSH predicted inundation areas. EHPA's located in Category 4/5 evacuation zones may provide emergency managers with additional sheltering options.

Category 4/5-related exemption decisions will be dependent upon the magnitude of the county and regional hurricane shelter space deficit, local logistical support capabilities and the availability of suitable alternatives (either in-place, or within the framework of a five-year plan.)

Rainfall or storm surge flooding or isolation. New educational facilities proposed to be located in areas subject to flooding or isolation due to rainfall or storm surge related flooding may be unsuitable for use as public hurricane evacuation shelters. Rainfall flooding includes closed-basin ponding, riverine and containment failure of dams and reservoirs. Long-term isolation of a hurricane shelter population presents logistical challenges for emergency managers and mass care support agencies, which normally prefer equally suitable buildings not subject to flooding or isolation. The challenges include staff rotation, resupply of food, water and other consumables, emergency medical assistance, sanitation, security concerns, communication, etc. Flooding and isolation-related exemption decisions will be dependent upon the magnitude of the county and regional hurricane shelter space deficit, design and construction standards of the facility, shelter floor elevation, local logistical support capabilities and the availability of suitable alternatives (either in-place, or within the framework of a five-year plan.)

Coastal Barrier Island. Coastal barrier islands are often less than two (2) miles wide with very low ground elevations above mean sea level (AMSL). As such, they are exceptionally at-risk to storm surge inundation, isolation, and exposure to the full force of hurricane winds. Also, ARC 4496 states that hurricane evacuation shelters must not to be located on barrier islands. Therefore, facilities on coastal barrier islands are often subject to an exemption from the EHPA criteria. Coastal barrier island exemption decisions will be dependent upon the magnitude of the county and regional hurricane shelter space deficit, shelter floor elevation, local logistical support capabilities and the availability of

suitable alternatives (either in-place, or within the framework of a five-year plan.) The Division uses s. 161.54(2), Florida Statutes to provide a definition for coastal barrier islands.

Hazardous Materials. Location of a proposed new educational facility within the Vulnerability Zone (VZ) of facilities that manufacture, use or store certain types and quantities of hazardous materials may make it unsuitable for use as public hurricane evacuation shelter. Just as with flooding isolation concerns, the possible impact of a hazardous materials spill or release presents public safety and logistical challenges to emergency managers and mass care support agencies. In addition to the challenges listed for flooding isolation, hazardous materials emergencies include detecting and communicating presence of a hazard, and implementing shelter-in-place or evacuation actions. However, most facilities with reportable quantities of hazardous materials are considered a low risk of hurricane-related spill or release due to presence of mitigation measures (e.g., limited quantities of materials, hardening of containment structures, etc.)

Hazardous materials-related exemption decisions will be dependent upon the potential for and probable impact of a hurricane-related spill or release, potential hurricane shelter's distance from hazardous materials facility, guidance from Local Emergency Planning Committee (LEPC) and local fire department, magnitude of the county and regional hurricane shelter space deficit, communication and warning capabilities, local logistical support capabilities and the availability of suitable alternatives (either in-place, or within the framework of a five-year plan.)

It should be noted that many educational facilities use or store hazardous materials that are used for janitorial services and maintenance, vocational or laboratory uses, refrigeration, water treatment, etc. Such materials are normally very limited in quantity, and suitably stored or protected, and therefore rarely a significant consideration for an exemption. The Division recommends consultation with the applicable LEPC and local fire department to determine appropriate precautionary measures.

Low Evacuation Demand. New educational facilities proposed to be located in areas with low evacuation demand may be considered for an EHPA exemption. Emergency managers and other mass care providers prefer to locate hurricane shelters in close proximity to the evacuees they will serve. Therefore, the emergency management agency may reduce the EHPA floor area square footage requirement to meet local evacuation demand needs, or possibly exempt the entire facility if a suitable alternative is available. Low evacuation demand exemption decisions will be dependent upon the magnitude of the county and regional hurricane shelter space deficit, local shelter demand needs and the availability of suitable alternatives (either in-place, or within the framework of a five-year plan.)

2.2.2 Size.

The required size of a hurricane evacuation shelter is very dependent upon local circumstances. To effectively utilize available resources and operational plans (e.g., staffing, feeding, security, etc.), a hurricane shelter located in an area with low evacuation demand can be significantly smaller than a hurricane shelter located near a highly populated evacuation zone. Public hurricane shelters can range from as small as about 50 spaces to as large as several thousand spaces.

Section 252.385(4)(b), F.S. can serve as a pertinent guide when establishing a minimum size criterion for public hurricane shelters. This statute applies to suitable Department of Management Services owned or leased facilities, and requires that the facility have a minimum of 2,000 square feet of net usable floor area. The required minimum net usable floor area can be in a single room, or a combination of rooms each having a minimum of 400 square feet of net usable floor area. At 20 square feet per hurricane shelter space, this translates into a minimum capacity of 100 spaces.

Therefore, to be consistent with s. 252.385(4)(b), F.S., the Division generally considers new educational facilities with less than 2,000 square feet of net usable floor area to be small enough for an exemption.

2.2.3 Other Considerations.

"Other Considerations" is interpreted to mean any factor that, despite code-required investment in public funds to enhance the hurricane safety of a facility, is determined to make the facility inappropriate for use as a public hurricane evacuation shelter. This will generally be related to incompatibility of a facility's normal function or availability with public shelter operations.

As examples, the following types of spaces are normally excluded during calculation of net usable occupant capacity of a hurricane shelter, and are therefore often avoided by emergency managers when selecting hurricane shelters:

> Mechanical, plumbing, electrical, telephone and communication equipment rooms, storage rooms and closets, exterior/outside circulation and corridors, restrooms and shower areas, kitchen and food preparation rooms, science labs, computer and information technology labs, vocational and industrial technology labs and shops, library and media rooms and labs, exercise rooms with fixed equipment, administrative office and support areas, data and word processing rooms and areas, record vaults, mail rooms, custodial rooms and work areas, medical clinic and first aid rooms, residential and dormitory rooms and areas, radio or television broadcast facilities, attics and crawl spaces, etc.

New educational facilities that are designed exclusively to serve these functions may be exempted from complying with the EHPA criteria.

Other considerations may also include local strategies and long-range plans. As an example, to reduce costs and maximize hurricane shelter utility, a board and local emergency management agency may agree (in writing) that 100 percent of the floor area of new high schools will be constructed to the EHPA criteria, instead of the minimum of 50 percent, in exchange for reducing or eliminating EHPA requirements for middle and elementary schools. The proposed plan eliminates the county hurricane shelter space deficit, plus creates additional space toward reducing the regional deficit, within about five years. Thus the long-range plan achieves statutory intent, and exemptions for applicable middle and elementary schools are acceptable.

2.2.4 Alterations or Maintenance of Existing Buildings.

Florida Statutes and the Florida Building Code both state that the EHPA criteria apply to "new educational facilities." Therefore, renovations, remodeling, maintenance and repair of existing buildings, as defined in s. 1013.01, F.S. and s. 423.5, Florida Building Code--Building, are exempt from compliance with the EHPA criteria.

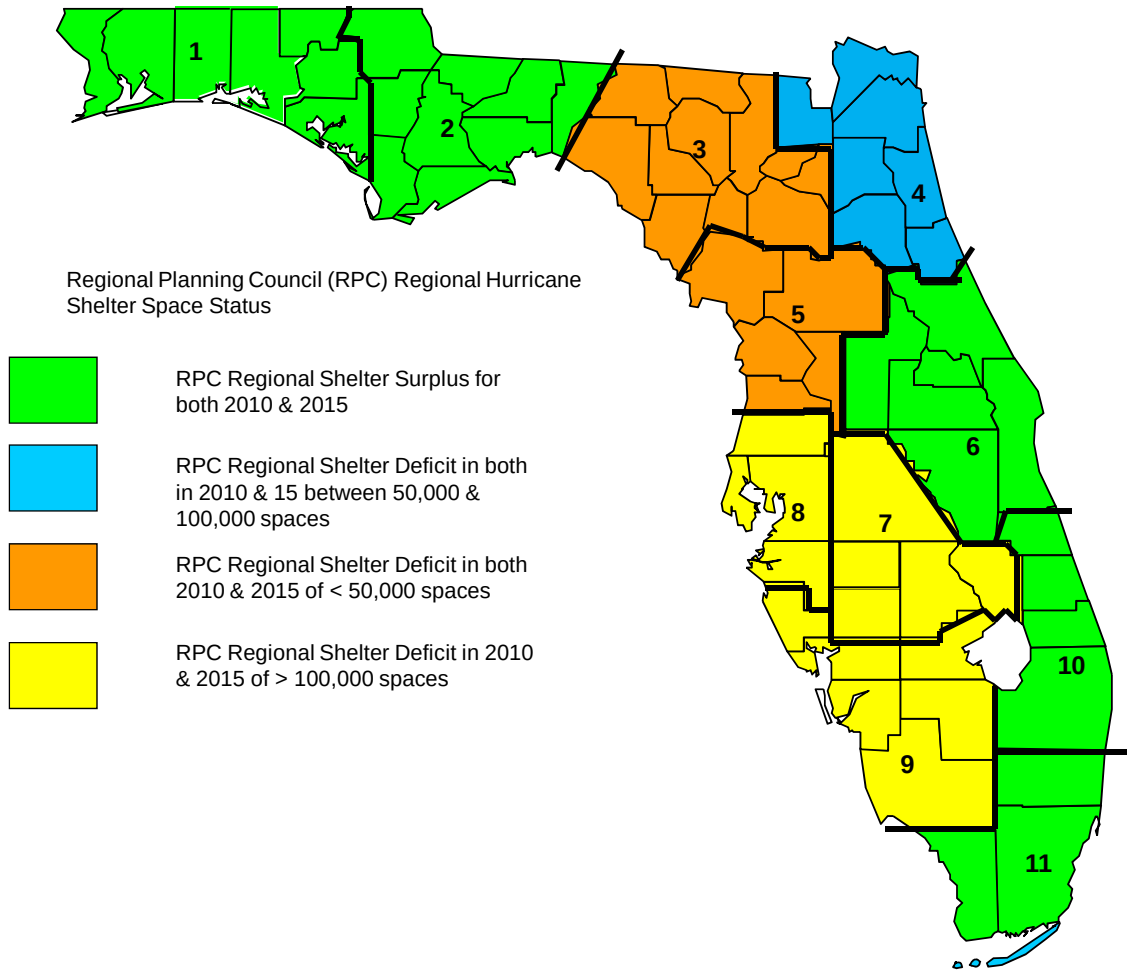
2.2.5 Regional Surplus of "Safe" Hurricane Shelter Space.

Section 1013.372, F.S. states that new educational facilities proposed to be located in a Regional Planning Council (RPC) region that does not have a hurricane evacuation shelter space deficit are not required to incorporate the EHPA criteria. The hurricane shelter surplus/deficit determination is established by biennial publication and approval of this Plan, which guides exemption decisions over a five year planning period.

As can be seen in Figure 2-1, only five (5) RPC regions have a surplus of hurricane shelter space in 2010: West Florida (region 1), Apalachee (region 2), East Central Florida (region 6), Treasure Coast (region 10) and South Florida (region 11). Based upon currently available information, surpluses will continue in RPC regions 1, 2, 6, 10, and 11 through 2015. All other regions have hurricane shelter space deficits, and per section 1013.372(1) and section 1013.74(4), Florida Statutes, their respective district school boards, community colleges and universities are required to construct all new educational facilities in compliance with the public shelter design criteria.

Therefore, this EHPA criteria exemption factor will not be applicable for 38 of 67 counties for at least the next two years, if not more than five years. For more detailed information, please see Section 3.2.

Figure 2-1. Regional Hurricane Shelter Space Surplus/Deficit Status



2.2.6 Exemption Process.

In accordance with ss. 1013.372, F.S. and 423.25, F.S., Florida Building Code--Building, the following procedure is recommended by the Division when requesting exemptions from the public shelter design criteria/EHPA requirement:

1. The board must notify the local emergency management agency of all educational facility construction projects that meet the definition of new construction.

2. The board must evaluate each new educational facility construction project to determine if a statutory or code specified exemption to the criteria is applicable.

3. If an exemption is not requested, the board should consult with the local emergency management agency to identify those areas of the new facilities that will maximize public shelter capacity, and meet the needs of both the educational and emergency management purpose.

4. If the board requests an exemption, the request must be prepared and submitted in writing to either the local emergency management agency or the Division. The request must identify the specific statutory or code factor(s) to be considered for the exemption, and provide appropriate supporting documentation.

5. If the local emergency management agency or the Division concurs with the exemption request, a written response stating the concurrence will exempt the new educational facility from the criteria.

6. If the local emergency management agency or the Division does not concur in writing with the exemption request, then the board must comply with the criteria.

2.3 Estimate of School Board Compliance with EHPA Requirement

In 2001, staff from the Auditor General's Office performed a hurricane shelter and grant management operational audit of the Department of Community Affairs. See Auditor General Report No. 02-055, dated October, 2001. In Finding No. 2 of the report, the Auditor General found that a significant number of new educational facilities, constructed by district school boards and community colleges, had not complied with the public shelter design criteria, and had not received an exemption (written) by local emergency management agencies or the Division. Given the projected deficits of public hurricane shelter space in this state, the Auditor General indicated that steps must be taken to remedy the situation.

Auditor General's Report No. 02-055 can be viewed at the following web address:

http://www.myflorida.com/audgen/pages/pdf_files/02-055.pdf .

The Auditor General also recommended that the Division, in consultation with the State Legislature, Florida Department of Education and local emergency management officials, continue its efforts to ensure compliance with the provisions of the law. Subsequently, the Department of Education distributed memorandum number DPBM No. 02-42 (from Wayne V. Pierson, dated October 31, 2001) that reiterated the necessity for compliance with the statute. A copy of memorandum DPBM No. 02-42 is included in Appendix I.

Since distribution of the Auditor General's report and the Department of Education's memorandum in 2001, the Division has taken additional steps to encourage compliance with the EHPA criteria through the emergency management community. In 2003, with the assistance of the Department of Education, the Division compiled a list of new school facilities from the Florida Inventory of School Houses (FISH) with construction years between 2000 and 2003. Unless exempted, these school facilities were lawfully required to incorporate the EHPA criteria. The lists were forwarded to local emergency managers to assist them in determining local compliance, as well as assist in identifying additional unreported shelter capacity.

The Division also annually requests hurricane shelter capacity data that is sorted to differentiate new school EHPA's, retrofit, and "as-is" (i.e., ARC 4496 hurricane shelter facilities that are not classified as a retrofit or EHPA) shelter space. This data is used to monitor progress toward eliminating county-level, regional and statewide hurricane shelter space deficits. The data also provides a means of tracking EHPA productivity on an annual basis.

The Division substantially revised the 2004 Statewide Emergency Shelter Plan to incorporate guidance to assist local school boards and emergency managers with implementing the criteria. The Division also participated in workshops at several conferences that included a presentation of EHPA construction requirements, code compliance and implementation strategies. The conferences were attended by emergency managers and their shelter program partners, school board officials, code enforcement officials, architects and engineers (e.g., National Hurricane Conference, Governor's Hurricane Conference, Florida Emergency Preparedness Association Meetings, etc.)

In preparation for the 2010 Plan, the Division again collaborated with the Department of Education to compile a list of new school facilities from the FISH data. This time the list of new facilities included those constructed between 2000 and 2009 with at least 4,000 net square feet. Universities and community colleges were not included primarily due to the fact that they only account for about two (2) percent of the statewide shelter space inventory. The data was then used in coordination with local

emergency managers to estimate compliance by school boards with the EHPA requirement.

The FISH data was analyzed to determine which facilities were located in Category 1, 2 or 3 storm surge evacuation zones, and those that had relatively little usable floor area (i.e., less than 2,000 square feet of net usable space). These characteristics provide a cause for an exemption. The Division also incorporated data from the facilities that were previously recognized as meeting EHPA criteria. The data was then tabulated and distributed to local emergency managers. The Division requested that local emergency managers verify which facilities are recognized as EHPA's, and which facilities (if any) received written exemptions from their office. The Division has not granted an exemption, so any exemptions would have been local. Table 2-1 provides a summary of the findings.

Table 2-1. Estimate of Local Compliance with EHPA Requirements

Description	Number of Buildings	Net Square Feet
Total Number of New Buildings for Years 2000 to 2009	3,092	61,421,969
Division Recognized EHPA Buildings	669	16,298,638
Total Number of New Buildings exempted per Code	1,125	24,171,567
Total Number of New Buildings that met Lawful Requirements	1,794	40,470,205
Total Number of New Buildings that did not meet Lawful Requirements	1,298	20,951,764
Percentage of New Buildings that Complied with the Law	58	66
Percentage of New Buildings that did not Comply with the Law	42	34
Potential EHPA Space Lost (50% required by Code)	---	10,475,882
Potential EHPA Net Square Feet Lost (usable NSF after application of usability factors)	---	6,962,973
Potential EHPA Spaces Lost (at Code required 20 square feet each)	---	348,149 spaces

According to the Florida Inventory of School Houses (FISH) data, there were 3,092 new school buildings (based on at least 4,000 net square feet of area per room types listed in Appendix H) constructed between 2000 and 2009, with an estimated total net floor area of 61,421,969 square feet. The Division recognizes 669 facilities (16,298,638 net square feet) as meeting the EHPA requirements of the law, and another 1,125 buildings (24,171,567 square feet) were lawfully exempt for statutory and code provided causes. Therefore, only about 1,794 of 3,092 new buildings complied with statutory and code EHPA requirements.

Since the EHPA code requirements are based on achieving a minimum quantity of floor area square footage, the square footage is the most reliable means of estimating compliance. The combined floor area square footage of the non-compliant buildings is 20,951,764 square feet, or a non-compliance rate of 34 percent. The result of the survey indicates that compliance rate, statewide, has not significantly improved. There was sufficient square footage in the non-compliant new buildings to have substantially reduced Florida's current hurricane shelter space deficit.

3.0 REGIONAL HURRICANE EVACUATION SHELTER REQUIREMENTS

NOTE: The State of Florida is currently undergoing a comprehensive Statewide Regional Evacuation Study due to be completed in late-2010. This study will include an update of SLOSH modeling and surge zones for all of Florida's basins (to include LiDAR data of the state's entire coastal zone), a statewide evacuation Behavioral Study, statewide Shelter Analysis and Transportation modeling tool.

3.1 Methodology for Calculating Regional and County Hurricane Evacuation Shelter Status

Location and Square Footage of Existing Shelters. The location and square footage of existing shelters can be found in Appendix A, which provides a detailed inventory of shelter locations and capacities within each region and county. The tables in Appendix A use the terms "risk" and "host" shelters. Risk shelters include those shelter spaces designated for use during hurricanes, and host shelters include those spaces available for general use outside of a forecasted hurricane impact area. The terms "risk" and "host" shelters are further defined in Appendix E.

Location and Square Footage of Needed Shelters. Region/County estimates for Shelter Capacity, Shelter Demands, and Shelter Surpluses/Deficits are provided in Table 3-1 and are based on worst case scenario. Results contained in Table 3-1 for 2010 and 2015 are displayed in number of persons. Region/County square feet estimates for 2010 and 2015, using the same worst case scenario, are provided in Table 3-2.

Shelter Demand Sources/Results by County. 2010 through 2015 county shelter demand estimates for vulnerable populations are provided for Storm Categories 4 and 5. Vulnerable populations are defined as populations located in coastal surge zones, flood prone areas and those living in manufactured housing. Source data for these estimates, including demographics, estimated percent vulnerable populations, estimated percent of vulnerable populations expected to seek public shelter, and data sources (Hurricane Evacuation Studies) can be found in Appendix J.

The 2010 through 2015 population estimates are based the Bureau of Economic and Business Research population estimates report (Mar 2009). The Bureau of Economic and Business Research is an applied research center in the Warrington College of Business Administration at the University of Florida. Percent vulnerable populations and percent of vulnerable populations expected to seek public shelter were derived from the most current Hurricane Evacuation Study or updated evacuation study module. Appendix J lists the study used for each region. Using the planning assumption that Florida continues to experience population growth along its coastline the percentages obtained or calculated from data within the studies were then applied to population estimates published by the Bureau of Economic and Business Research.

Determining County Shelter Capacities. County shelter capacity data for all 67 counties were updated by local emergency management agencies through 2009, and also cross-referenced with the *2009 Shelter Retrofit Report*. Since 1995, Florida has been implementing ARC 4496 hurricane shelter selection standards and Florida's *Model Hurricane Evacuation Shelter Selection Guidelines*. Therefore, based upon subsequent results of regional and county hurricane shelter surveys, local emergency management agencies were requested to provide shelter inventory capacities based on those facilities that met the required ARC 4496 standards, and separately those facilities that did not.

Those facilities that have not yet been surveyed, and therefore have not yet been documented to meet the above standards, were designated as facilities not meeting the ARC 4496 standards. The Division has standardized a consistent methodology of calculating shelter capacities across the state for the purpose of this Plan. For each shelter, a net square footage for the building was pulled from the Florida Department of Education's FISH (Florida Inventory of School Houses) database, including only those room types specified in Appendix H of this Plan. Then, each room's square footage was multiplied by a usability factor based on room type. See Appendix H. This allowed for the space lost to furniture and for walkway space and generated a "lay-down" or square footage area actually usable for bunk space. This figure was then divided by 20 square feet per person for General Population Risk Shelters and 60 square feet per client for Special Needs Risk Shelters. These are the square footages and capacities used to calculate the shelter deficit reduction in this Plan.

The Division recognizes that many counties have local preferences and practices that may further limit usage of buildings. For example, one county may choose to utilize only hallways, gyms or cafeterias, even though the rest of the building (i.e. classrooms) also meets ARC 4496 guidelines. In some cases, the limiting factor is the number of available staff, i.e., they can staff for only 500 people in a given location, even though they have room for many more. Also the local shelter capacity at a specific building may exceed local need. In recognition of these and other variances, the Division has included a column, "Local Planned Usage" in the individual county charts in Appendix A, showing local planned usage of particular shelters. However, it should be noted that the capacities calculated per the method in the paragraph above, still exist and could, in an emergency, be utilized and therefore are counted against the shelter deficit.

Determining County Shelter Demand. The hurricane shelter demand percentage for each county reflects the percentage of a county's vulnerable population that is projected to seek public shelter. These percentages are based on the conclusions of the behavioral analyses conducted for each of the regional hurricane evacuation studies. The analyses utilize survey and statistical methodologies to estimate behavioral responses to various hurricane scenarios. It is important to note that results obtained by a survey do NOT always correlate to actual behavior. What people say they will do during a "blue sky" survey often differs from actual behavior, which is influenced by a number of factors. Strength of storm, time since most recent significant disaster, and previous experience (or lack of) with tropical weather are just a few factors that influence a person's decision to evacuate or seek shelter. Hence, shelter demand may fluctuate over

time. All estimates are based on a worst case storm scenario and optimal compliance with local evacuation orders.

Most of the behavioral analyses in the state have been prepared on a regional basis by Hazards Management Group (HMG) and are therefore a consistent benchmark relative to the survey methodologies and statistical applications. The public shelter use percentages in the behavioral section of the hurricane evacuation study are combined with local income characteristics in the hurricane risk area (two important variables in determining public shelter use) to calculate shelter demand numbers. HMG performed behavioral analyses as part of the hurricane evacuation study in all regions and counties, except for the East Central and Central Florida regions. Nonetheless, shelter demand numbers were provided in the hurricane evacuation study and those figures were used for the purposes of this plan.

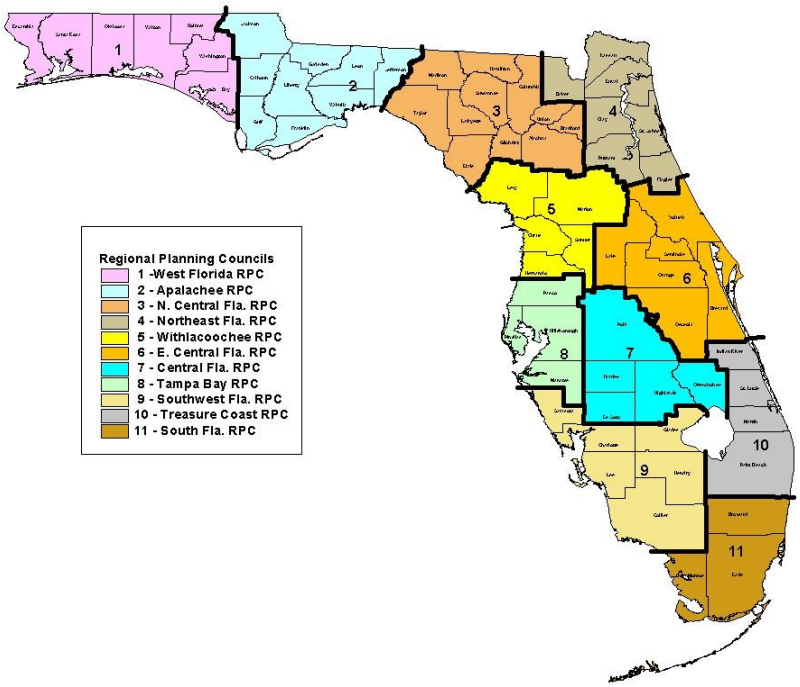
The hurricane evacuation studies conducted for all regions of Florida between 1988 and 2000 include shelter demand figures for each county. For this Plan, these data served as the basis for estimating the shelter demand for coastal and inland counties between 2010 and 2015. The same methodology for projecting the vulnerable population during this period was used to calculate the estimated shelter demand figures for those years.

The Shelter Demand for the Persons with Special Needs (PSN) had to be derived differently. There have not been any behavioral studies conducted to date that consider the specific demands for PSN population versus General Population (GP). Lacking this foundation, the PSN demand figures contained in this Plan were generated by selecting the highest figure of three separate factors for each county. The two factors considered were: (1) the maximum daily census of PSN clients in SpNSs in each county during the 2004 and 2005 hurricane seasons and; (2) the local Emergency Management Agencies estimate of demand for PSN clients (note: the 2010 and 2015 PSN estimates were derived from general population increases or decreases between 2008-2010)

3.2 Location and Square Footage of Existing and Needed Shelters

Tables 3-1 and 3-2 below provide information regarding location and shelter occupant capacity of both existing and needed hurricane shelters (i.e., risk shelters) for each of the 67 Florida counties. The tables also show which regions of the state have a deficit of hurricane shelter space.

Figure 3-1. Regional Planning Council (RPC) Regions of Florida



3.3 Pet-Friendly Shelters Availability

A recurrent concern noted during past hurricanes is the need to provide for shelters for pets. In many cases, pet-owners are unwilling to go to shelters during hurricanes due the lack of facilities to keep their pets. Most shelters will only allow guide dogs or similar service animals. In some counties provisions have been made at local Agricultural Centers for horses and large animals. In a few cases, rooms (i.e. locker rooms) were set aside in risk/storm shelters for pets that were brought anyway. Pursuant to s. 252.385(2)(b), F.S., the Division is tasked with tracking the availability of pet-friendly shelters across the state. As of this time, the best available information indicates the following:

In 42 counties- pet-owners are advised of local hotels that will accept pets. No pet-friendly public risk shelters are provided.

In 6 counties- No public risk shelters are pet-friendly. And no local hotels are recognized as accepting pets.

In 19 counties- some pet-friendly shelters are provided with a total of 20,094 risk shelter spaces (state-wide) located in the pet-friendly shelters. These pet-friendly shelters

are designated with an "A" under the General (G), People with Special Needs (P), Pet-Friendly (A) column in the by-county listings. See Appendix A.

NOTE: As a matter of clarification, the Florida Division of Emergency Management defines "Pet-Friendly Shelters" as public risk shelters that have made arrangements to accept domestic companion pets. Normally this includes setting aside separate areas within the shelter complex with cages to control pets and isolate them from other sheltering public. Those shelters that are only for pets (not accompanied by owners) are classified as "Pet Storage Facilities" and not included in our Pet Friendly Shelter numbers.

TABLE 3-1

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2010 Category 5 Shelter Demand In People (estimated)	2015 Category 5 Shelter Demand In People (estimated)	2010 Risk Shelter Capacity In People	2010 Shelter Surplus/ Deficit In People	2015 Shelter Surplus/ Deficit In People	2010 Category 5 Shelter Demand In Clients (estimated)	2015 Category 5 Shelter Demand In Clients (estimated)	2010 Risk Shelter Capacity In Clients	2010 Shelter Surplus/ Deficit In Clients	2015 Shelter Surplus/ Deficit In Clients
1	BAY	15,336	16,205	17,699	2,363	1,494	2,238	2,364	915.00	(1,323)	(1,449)
1	ESCAMBIA	12,452	12,843	15,502	3,050	2,659	516	527	497.00	(19)	(30)
1	HOLMES	1,170	1,205	1,100	(70)	(105)	20	21	38.00	18	17
1	OKALOOSA	13,025	13,714	13,794	769	80	77	82	70.00	(7)	(12)
1	SANTA ROSA	8,048	8,705	12,927	4,879	4,222	130	140	704.00	574	564
1	WALTON	5,656	6,335	8,383	2,727	2,048	44	49	92.00	48	43
1	WASHINGTON	1,358	1,446	4,492	3,134	3,046	146	153	144.00	(2)	(9)
Region 1 Subtotals:		57,045	60,453	73,897	16,852	13,444	3,171	3,336	2,460.00	(711)	(876)
2	CALHOUN	1,095	1,125	0	(1,095)	(1,125)	50	51	0.00	(50)	(51)
2	FRANKLIN	1,004	1,076	0	(1,004)	(1,076)	48	52	0.00	(48)	(52)
2	GADSDEN	3,316	3,469	4,917	1,601	1,448	264	273	0.00	(264)	(273)
2	GULF	998	1,028	460	(538)	(568)	20	20	0.00	(20)	(20)
2	JACKSON	3,530	3,684	3,034	(496)	(650)	194	201	33.00	(161)	(168)
2	JEFFERSON	1,119	1,149	809	(310)	(340)	33	34	0.00	(33)	(34)
2	LEON	9,317	9,712	22,398	13,081	12,686	175	182	705.00	530	523
2	LIBERTY	1,000	1,068	1,150	150	82	208	223	76.00	(132)	(147)
2	WAKULLA	1,128	1,269	800	(328)	(469)	49	55	0.00	(49)	(55)
Region 2 Subtotals:		22,507	23,580	33,568	11,061	9,988	1,041	1,091	814.00	(227)	(277)
3	ALACHUA	9,576	10,103	6,451	(3,125)	(3,652)	2,450	2,684	534.00	(1,916)	(2,150)
3	BRADFORD	2,294	2,412	1,462	(832)	(950)	136	144	197.00	61	53
3	COLUMBIA	6,337	6,720	4,661	(1,676)	(2,059)	76	81	0.00	(76)	(81)
3	DIXIE	2,562	2,768	2,051	(511)	(717)	55	59	84.00	29	25

TABLE 3-1											
		General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
RPC Region #	County	2010 Category 5 Shelter Demand In People (estimated)	2015 Category 5 Shelter Demand In People (estimated)	2010 Risk Shelter Capacity In People	2010 Shelter Surplus/ Deficit In People	2015 Shelter Surplus/ Deficit In People	2010 Category 5 Shelter Demand In Clients (estimated)	2015 Category 5 Shelter Demand In Clients (estimated)	2010 Risk Shelter Capacity In Clients	2010 Shelter Surplus/ Deficit In Clients	2015 Shelter Surplus/ Deficit In Clients
3	GILCHRIST	2,170	2,342	3,243	1,073	901	52	56	102.00	50	46
3	HAMILTON	1,537	1,568	1,397	(140)	(171)	10	10	101.00	91	91
3	LAFAYETTE	1,185	1,222	570	(615)	(652)	1	1	60.00	59	59
3	MADISON	1,782	1,887	4,487	2,705	2,600	30	32	28.00	(2)	(4)
3	SUWANNEE	5,768	6,187	3,484	(2,284)	(2,703)	81	88	50.00	(31)	(38)
3	TAYLOR	2,576	2,705	3,626	1,050	921	142	151	0.00	(142)	(151)
3	UNION	1,277	1,332	1,251	(26)	(81)	82	86	33.00	(49)	(53)
Region 3 Subtotals:		37,064	39,246	32,683	(4,381)	(6,563)	3,115	3,392	1,189.00	(1,926)	(2,203)
4	BAKER	2,840	3,024	2,476	(364)	(548)	148	156	0.00	(148)	(156)
4	CLAY	21,720	23,986	5,938	(15,782)	(18,048)	394	434	152.00	(242)	(282)
4	DUVAL	70,886	75,367	43,982	(26,904)	(31,385)	1,839	1,973	2,377.00	538	404
4	FLAGLER	4,988	5,988	4,130	(858)	(1,858)	632	755	176.00	(456)	(579)
4	NASSAU	4,236	4,715	3,373	(863)	(1,342)	282	315	110.00	(172)	(205)
4	PUTNAM	9,134	9,329	1,876	(7,258)	(7,453)	162	166	144.00	(18)	(22)
4	ST.JOHNS	10,616	12,364	11,522	906	(842)	538	632	766.00	228	134
Region 4 Subtotals:		124,420	134,773	73,297	(51,123)	(61,476)	3,995	4,431	3,725.00	(270)	(706)
5	CITRUS	8,909	9,612	4,751	(4,158)	(4,861)	454	490	138.00	(316)	(352)
5	HERNANDO	4,768	5,256	9,263	4,495	4,007	1,744	1,913	666.00	(1,078)	(1,247)
5	LEVY	2,490	2,693	2,473	(17)	(220)	159	172	136.00	(23)	(36)
5	MARION	24,981	27,293	12,227	(12,754)	(15,066)	1,004	1,091	820.00	(184)	(271)
5	SUMTER	7,006	8,391	544	(6,462)	(7,847)	610	733	0.00	(610)	(733)
Region 5 Subtotals:		48,154	53,245	29,258	(18,896)	(23,987)	3,971	4,399	1,760.00	(2,211)	(2,639)

TABLE 3-1											
		General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
RPC Region #	County	2010 Category 5 Shelter Demand In People (estimated)	2015 Category 5 Shelter Demand In People (estimated)	2010 Risk Shelter Capacity In People	2010 Shelter Surplus/ Deficit In People	2015 Shelter Surplus/ Deficit In People	2010 Category 5 Shelter Demand In Clients (estimated)	2015 Category 5 Shelter Demand In Clients (estimated)	2010 Risk Shelter Capacity In Clients	2010 Shelter Surplus/ Deficit In Clients	2015 Shelter Surplus/ Deficit In Clients
6	BREVARD	16,647	18,128	41,918	25,271	23,790	1,956	2,085	2,668.00	712	583
6	LAKE	18,886	22,193	30,122	11,236	7,929	1,087	1,218	356.00	(731)	(862)
6	ORANGE	12,651	14,698	26,122	13,471	11,424	3,007	3,377	955.00	(2,052)	(2,422)
6	OSCEOLA	11,986	15,071	23,150	11,164	8,079	1,219	1,408	1,331.00	112	(77)
6	SEMINOLE	3,519	3,947	15,593	12,074	11,646	71	69	300.00	229	231
6	VOLUSIA	31,370	34,997	24,958	(6,412)	(10,039)	635	661	2,268.00	1,633	1,607
Region 6 Subtotals:		95,059	109,034	161,863	66,804	52,829	7,975	8,818	7,878.00	(97)	(940)
7	DESOTO	5,708	6,363	2,542	(3,166)	(3,821)	102	107	211.00	109	104
7	HARDEE	5,221	5,464	5,838	617	374	92	93	110.00	18	17
7	HIGHLANDS	9,450	10,234	9,904	454	(330)	145	144	465.00	320	321
7	OKEECHOBEE	10,600	11,129	2,939	(7,661)	(8,190)	154	162	0.00	(154)	(162)
7	POLK	160,306	176,650	39,081	(121,225)	(137,569)	3,785	4,118	654.00	(3,131)	(3,464)
Region 7 Subtotals:		191,285	209,840	60,304	(130,981)	(149,536)	4,278	4,624	1,440.00	(2,838)	(3,184)
8	HILLSBOROUGH	132,510	146,056	102,297	(30,213)	(43,759)	4,393	4,765	2,250.00	(2,143)	(2,515)
8	MANATEE	36,994	41,382	40,297	3,303	(1,085)	1,306	1,405	998.00	(308)	(407)
8	PASCO	59,873	68,751	34,199	(25,674)	(34,552)	1,556	1,687	1,317.00	(239)	(370)
8	PINELLAS	109,681	113,997	45,569	(64,112)	(68,428)	6,281	6,310	2,268.00	(4,013)	(4,042)
Region 8 Subtotals:		339,058	370,186	222,362	(116,696)	(147,824)	13,536	14,167	6,833.00	(6,703)	(7,334)
9	CHARLOTTE	31,095	34,291	3,127	(27,968)	(31,164)	650	693	0.00	(650)	(693)
9	COLLIER	43,885	53,760	25,136	(18,749)	(28,624)	1,621	1,776	394.00	(1,227)	(1,382)
9	GLADES	5,818	6,144	812	(5,006)	(5,332)	10	11	110.00	100	99

TABLE 3-1											
		General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
RPC Region #	County	2010 Category 5 Shelter Demand In People (estimated)	2015 Category 5 Shelter Demand In People (estimated)	2010 Risk Shelter Capacity In People	2010 Shelter Surplus/ Deficit In People	2015 Shelter Surplus/ Deficit In People	2010 Category 5 Shelter Demand In Clients (estimated)	2015 Category 5 Shelter Demand In Clients (estimated)	2010 Risk Shelter Capacity In Clients	2010 Shelter Surplus/ Deficit In Clients	2015 Shelter Surplus/ Deficit In Clients
9	HENDRY	12,348	13,146	6,311	(6,037)	(6,835)	37	40	0.00	(37)	(40)
9	LEE	133,211	155,001	35,422	(97,789)	(119,579)	1,130	1,270	1,700.00	570	430
9	SARASOTA	52,105	57,433	45,413	(6,692)	(12,020)	3,396	3,667	3,938.00	542	271
Region 9 Subtotals:		278,462	319,775	116,221	(162,241)	(203,554)	6,844	7,457	6,142.00	(702)	(1,315)
10	INDIAN RIVER	5,764	6,447	8,392	2,628	1,945	501	542	582.00	81	40
10	MARTIN	8,933	9,929	22,392	13,459	12,463	392	408	1,228.00	836	820
10	PALM BEACH	47,288	53,474	57,986	10,698	4,512	285	296	800.00	515	504
10	ST.LUCIE	8,747	10,098	16,885	8,138	6,787	652	741	500.00	(152)	(241)
Region 10 Subtotals:		70,732	79,948	105,655	34,923	25,707	1,830	1,987	3,110.00	1,280	1,123
11	BROWARD	36,194	39,462	59,193	22,999	19,731	334	347	1,550.00	1,216	1,203
11	MIAMI-DADE	68,308	72,890	104,402	36,094	31,512	869	909	2,731.00	1,862	1,822
11	MONROE	20,302	20,693	602	(19,700)	(20,091)	262	259	121.00	(141)	(138)
Region 11 Subtotals:		124,804	133,045	164,197	39,393	31,152	1,465	1,515	4,402.00	2,937	2,887
	Totals	1,388,590	1,533,125	1,073,305	(315,285)	(459,820)	51,221	55,217	39,753.00	(11,468)	(15,464)

Table 3-2

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2010 Category 5 Shelter Demand In SF (estimated)	2015 Category 5 Shelter Demand In SF (estimated)	2010 Risk Shelter Capacity In SF	2010 Shelter Surplus/ Deficit In SF	2015 Shelter Surplus/ Deficit In SF	2010 Category 5 Shelter Demand In SF(estimated)	2015 Category 5 Shelter Demand In SF (estimated)	2010 Risk Shelter Capacity In SF	2010 Shelter Surplus/ Deficit In SF	2015 Shelter Surplus/ Deficit In SF
1	BAY	306,720	324,100	274,370	(32,350)	(49,730)	134,280	141,840	68,159	(66,121)	(73,681)
1	ESCAMBIA	249,040	256,860	361,908	112,868	105,048	30,960	31,620	26,212	(4,748)	(5,408)
1	HOLMES	23,400	24,100	22,012	(1,388)	(2,088)	1,200	1,260	2,280	1,080	1,020
1	OKALOOSA	260,500	274,280	219,231	(41,269)	(55,049)	4,620	4,920	4,200	(420)	(720)
1	SANTA ROSA	160,960	174,100	250,317	89,357	76,217	7,800	8,400	42,262	34,462	33,862
1	WALTON	113,120	126,700	173,079	59,959	46,379	2,640	2,940	5,495	2,855	2,555
1	WASHINGTON	27,160	28,920	94,484	67,324	65,564	8,760	9,180	8,666	(94)	(514)
	Region 1 Totals:	1,140,900	1,209,060	1,395,401	254,501	186,341	190,260	200,160	157,274	(32,986)	(42,886)
2	CALHOUN	21,900	22,500	0	(21,900)	(22,500)	3,000	3,060	0	(3,000)	(3,060)
2	FRANKLIN	20,080	21,520	0	(20,080)	(21,520)	2,880	3,120	0	(2,880)	(3,120)
2	GADSDEN	66,320	69,380	93,832	27,512	24,452	15,840	16,380	0	(15,840)	(16,380)
2	GULF	19,960	20,560	9,200	(10,760)	(11,360)	1,200	1,200	0	(1,200)	(1,200)
2	JACKSON	70,600	73,680	58,021	(12,579)	(15,659)	11,640	12,060	1,980	(9,660)	(10,080)
2	JEFFERSON	22,380	22,980	14,790	(7,590)	(8,190)	1,980	2,040	0	(1,980)	(2,040)
2	LEON	186,340	194,240	362,071	175,731	167,831	10,500	10,920	42,380	31,880	31,460
2	LIBERTY	20,000	21,360	21,121	1,121	(239)	12,480	13,380	4,579	(7,901)	(8,801)
2	WAKULLA	22,560	25,380	13,422	(9,138)	(11,958)	2,940	3,300	0	(2,940)	(3,300)
	Region 2 Totals:	450,140	471,600	572,457	122,317	100,857	62,460	65,460	48,939	(13,521)	(16,521)
3	ALACHUA	191,520	202,060	135,175	(56,345)	(66,885)	147,000	161,040	30,037	(116,963)	(131,003)

Table 3-2

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2010 Category 5 Shelter Demand In SF (estimated)	2015 Category 5 Shelter Demand In SF (estimated)	2010 Risk Shelter Capacity In SF	2010 Shelter Surplus/ Deficit In SF	2015 Shelter Surplus/ Deficit In SF	2010 Category 5 Shelter Demand In SF(estimated)	2015 Category 5 Shelter Demand In SF (estimated)	2010 Risk Shelter Capacity In SF	2010 Shelter Surplus/ Deficit In SF	2015 Shelter Surplus/ Deficit In SF
3	BRADFORD	45,880	48,240	24,514	(21,366)	(23,726)	8,160	8,640	13,139	4,979	4,499
3	COLUMBIA	126,740	134,400	92,258	(34,482)	(42,142)	4,560	4,860	0	(4,560)	(4,860)
3	DIXIE	51,240	55,360	44,204	(7,036)	(11,156)	3,300	3,540	5,039	1,739	1,499
3	GILCHRIST	43,400	46,840	65,218	21,818	18,378	3,120	3,360	6,115	2,995	2,755
3	HAMILTON	30,740	31,360	27,049	(3,691)	(4,311)	600	600	6,071	5,471	5,471
3	LAFAYETTE	23,700	24,440	10,216	(13,484)	(14,224)	60	60	3,600	3,540	3,540
3	MADISON	35,640	37,740	68,326	32,686	30,586	1,800	1,920	1,680	(120)	(240)
3	SUWANNEE	115,360	123,740	69,691	(45,669)	(54,049)	4,860	5,280	3,000	(1,860)	(2,280)
3	TAYLOR	51,520	54,100	62,034	10,514	7,934	8,520	9,060	0	(8,520)	(9,060)
3	UNION	25,540	26,640	29,705	4,165	3,065	4,920	5,160	2,010	(2,910)	(3,150)
	Region 3 Totals:	741,280	784,920	628,390	(112,890)	(156,530)	186,900	203,520	70,691	(116,209)	(132,829)
4	BAKER	56,800	60,480	50,003	(6,797)	(10,477)	8,880	9,360	0	(8,880)	(9,360)
4	CLAY	434,400	479,720	120,099	(314,301)	(359,621)	23,640	26,040	9,170	(14,470)	(16,870)
4	DUVAL	1,417,720	1,507,340	931,910	(485,810)	(575,430)	110,340	118,380	130,993	20,653	12,613
4	FLAGLER	99,760	119,760	75,863	(23,897)	(43,897)	37,920	45,300	10,560	(27,360)	(34,740)
4	NASSAU	84,720	94,300	90,636	5,916	(3,664)	16,920	18,900	8,838	(8,082)	(10,062)
4	PUTNAM	182,680	186,580	37,487	(145,193)	(149,093)	9,720	9,960	8,677	(1,043)	(1,283)
4	ST.JOHNS	212,320	247,280	240,912	28,592	(6,368)	32,280	37,920	76,000	43,720	38,080
	Region 4 Totals:	2,488,400	2,695,460	1,546,910	(941,490)	(1,148,550)	239,700	265,860	244,238	4,538	(21,622)
5	CITRUS	178,180	192,240	83,124	(95,056)	(109,116)	27,240	29,400	8,290	(18,950)	(21,110)
5	HERNANDO	95,360	105,120	188,883	93,523	83,763	104,640	114,780	40,000	(64,640)	(74,780)
5	LEVY	49,800	53,860	37,699	(12,101)	(16,161)	9,540	10,320	8,209	(1,331)	(2,111)

Table 3-2

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2010 Category 5 Shelter Demand In SF (estimated)	2015 Category 5 Shelter Demand In SF (estimated)	2010 Risk Shelter Capacity In SF	2010 Shelter Surplus/ Deficit In SF	2015 Shelter Surplus/ Deficit In SF	2010 Category 5 Shelter Demand In SF(estimated)	2015 Category 5 Shelter Demand In SF (estimated)	2010 Risk Shelter Capacity In SF	2010 Shelter Surplus/ Deficit In SF	2015 Shelter Surplus/ Deficit In SF
5	MARION	499,620	545,860	308,716	(190,904)	(237,144)	60,240	65,460	57,785	(2,455)	(7,675)
5	SUMTER	140,120	167,820	9,549	(130,571)	(158,271)	36,600	43,980	0	(36,600)	(43,980)
	Region 5 Totals:	963,080	1,064,900	627,971	(335,109)	(436,929)	238,260	263,940	114,284	(123,976)	(149,656)
6	BREVARD	332,940	362,560	909,469	576,529	546,909	117,360	125,100	171,061	53,701	45,961
6	LAKE	377,720	443,860	647,419	269,699	203,559	65,220	73,080	15,195	(50,025)	(57,885)
6	ORANGE	253,020	293,960	544,690	291,670	250,730	180,420	202,620	64,934	(115,486)	(137,686)
6	OSCEOLA	239,720	301,420	451,177	211,457	149,757	73,140	84,480	79,810	6,670	(4,670)
6	SEMINOLE	70,380	78,940	319,398	249,018	240,458	4,260	4,140	24,458	20,198	20,318
6	VOLUSIA	627,400	699,940	494,277	(133,123)	(205,663)	38,100	39,660	136,276	98,176	96,616
	Region 6 Totals:	1,901,180	2,180,680	3,366,430	1,465,250	1,185,750	478,500	529,080	491,734	13,234	(37,346)
7	DESOTO	114,160	127,260	49,373	(64,787)	(77,887)	6,120	6,420	9,594	3,474	3,174
7	HARDEE	104,420	109,280	123,091	18,671	13,811	5,520	5,580	4,500	(1,020)	(1,080)
7	HIGHLANDS	189,000	204,680	230,574	41,574	25,894	8,700	8,640	28,000	19,300	19,360
7	OKEECHOBEE	212,000	222,580	63,577	(148,423)	(159,003)	9,240	9,720	0	(9,240)	(9,720)
7	POLK	3,206,120	3,533,000	588,817	(2,617,303)	(2,944,183)	227,100	247,080	31,007	(196,093)	(216,073)
	Region 7 Totals:	3,825,700	4,196,800	1,055,432	(2,770,268)	(3,141,368)	256,680	277,440	73,101	(183,579)	(204,339)
8	HILLSBOROUGH	2,650,200	2,921,120	2,029,586	(620,614)	(891,534)	263,580	285,900	119,000	(144,580)	(166,900)
8	MANATEE	739,880	827,640	828,800	88,920	1,160	78,360	84,300	76,022	(2,338)	(8,278)
8	PASCO	1,197,460	1,375,020	673,983	(523,477)	(701,037)	93,360	101,220	59,280	(34,080)	(41,940)
8	PINELLAS	2,193,620	2,279,940	886,748	(1,306,872)	(1,393,192)	376,860	378,600	136,077	(240,783)	(242,523)

Table 3-2

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2010 Category 5 Shelter Demand In SF (estimated)	2015 Category 5 Shelter Demand In SF (estimated)	2010 Risk Shelter Capacity In SF	2010 Shelter Surplus/ Deficit In SF	2015 Shelter Surplus/ Deficit In SF	2010 Category 5 Shelter Demand In SF(estimated)	2015 Category 5 Shelter Demand In SF (estimated)	2010 Risk Shelter Capacity In SF	2010 Shelter Surplus/ Deficit In SF	2015 Shelter Surplus/ Deficit In SF
	Region 8 Totals:	6,781,160	7,403,720	4,419,117	(2,362,043)	(2,984,603)	812,160	850,020	390,379	(421,781)	(459,641)
9	CHARLOTTE	621,900	685,820	46,902	(574,998)	(638,918)	39,000	41,580	0	(39,000)	(41,580)
9	COLLIER	877,700	1,075,200	512,133	(365,567)	(563,067)	97,260	106,560	23,705	(73,555)	(82,855)
9	GLADES	116,360	122,880	13,688	(102,672)	(109,192)	600	660	8,794	8,194	8,134
9	HENDRY	246,960	262,920	118,060	(128,900)	(144,860)	2,220	2,400	0	(2,220)	(2,400)
9	LEE	2,664,220	3,100,020	740,800	(1,923,420)	(2,359,220)	67,800	76,200	102,000	34,200	25,800
9	SARASOTA	1,042,100	1,148,660	876,219	(165,881)	(272,441)	203,760	220,020	236,300	32,540	16,280
	Region 9 Totals:	5,569,240	6,395,500	2,307,802	(3,261,438)	(4,087,698)	410,640	447,420	370,799	(39,841)	(76,621)
10	INDIAN RIVER	115,280	128,940	269,105	153,825	140,165	30,060	32,520	34,920	4,860	2,400
10	MARTIN	178,660	198,580	426,627	247,967	228,047	23,520	24,480	82,231	58,711	57,751
10	PALM BEACH	945,760	1,069,480	1,355,442	409,682	285,962	17,100	17,760	48,000	30,900	30,240
10	ST.LUCIE	174,940	201,960	391,338	216,398	189,378	39,120	44,460	31,201	(7,919)	(13,259)
	Region 10 Totals:	1,414,640	1,598,960	2,442,512	1,027,872	843,552	109,800	119,220	196,352	86,552	77,132
11	BROWARD	723,880	789,240	1,381,965	658,085	592,725	20,040	20,820	124,034	103,994	103,214
11	MIAMI-DADE	1,366,160	1,457,800	2,100,769	734,609	642,969	52,140	54,540	158,520	106,380	103,980
11	MONROE	406,040	413,860	10,220	(395,820)	(403,640)	15,720	15,540	5,443	(10,277)	(10,097)
	Region 11 Totals:	2,496,080	2,660,900	3,492,954	996,874	832,054	87,900	90,900	287,997	200,097	197,097
	Totals	27,771,800	30,662,500	21,855,376	(5,916,424)	(8,807,124)	3,073,260	3,313,020	2,445,788	(627,472)	(867,232)

4.0 TYPES OF PUBLIC FACILITIES THAT SHOULD COMPLY WITH PUBLIC SHELTER DESIGN CRITERIA

By statute, all suitable public facilities are subject to being used as public hurricane evacuation shelters in a declared state or local emergency. See s. 252.38, F.S. Therefore, any suitable new public facility should include the EHPA criteria. This includes not only public educational facilities, but also certain types of state and local government facilities. In general, facilities that are designed for public assembly, either as a primary or auxiliary use, may be appropriate for use as public shelters during an emergency. At this time, only public educational facilities are subject to the EHPA criteria by statute and code. This is primarily due to the fact that public educational facilities account for more than 98 percent of current public hurricane shelter space, and relatively few other state and local facilities are appropriate for use as public shelters.

The public shelter space may be located in a single building or a complex of buildings, placed in a single large room or a complex of rooms in close proximity to each other, or in one or more stories of multistory building(s); preferably with a means of inside circulation and convenient access to toilets.

To determine if a proposed new public facility should be subject to the EHPA criteria, regardless of non-educational function or agency with ownership, the proposed facility should be reviewed based upon the exemption criteria given in Section 2.2 of this Plan. Facilities not subject to an exemption may be appropriate for use as public hurricane shelters. The decision to incorporate the EHPA criteria into a new public facility must be coordinated with the local emergency management agency(s) or the Division.

4.1 Public Schools and Community Colleges

District public schools (K-12) are the primary source of public hurricane shelter space in Florida, accounting for about 96 percent of current capacity. This is due to the fact that schools are widely distributed in populated areas, school facilities are designed for large assembly occupancies with many inherent mass care features (e.g., adequate quantity of toilets, dining/feeding areas, etc.), access to the facilities can be coordinated through a single local agency, etc. The types of school buildings that are potentially appropriate for use as public shelters include gymnasiums, cafeterias, multipurpose facilities, auditoriums, certain classroom buildings, etc.

Community colleges account for only about one (1) percent of current public shelter capacity. Community colleges are regionally distributed, and potentially located in areas with high demands for public hurricane shelter space. Like K-12 public schools, community colleges are normally designed for large assembly occupancies and possess many inherent mass care features. The types of college buildings that are potentially appropriate for use as public shelters include gymnasiums, cafeterias, multipurpose facilities, auditoriums, certain classroom buildings, etc.

4.2 Charter Schools

Charter schools appear to have a general exemption from meeting many of the requirements of the K-20 Education Code; reference s. 1002.33(16)(a), F.S. However, s. 1002.33(18), F.S. requires charter schools to utilize facilities which comply with the generally applicable provisions of the Florida Building Code, and may opt to comply with the State Requirements of Educational Facilities (SREF). According to this statute it appears that new charter school facilities are subject to Chapter 423, *Florida Building Code--Building*, and to the EHPA criteria.

Charter schools may be used to expand the capacity of the public school system. Therefore, under some circumstances, a charter school may replace construction of a new public school facility within a geographic area of a county or region where there is significant demand for public hurricane shelter space. Under normal circumstances, a new public school facility would be lawfully required by statute and code to incorporate the EHPA criteria. If charter schools were exempt, this would limit the ability of both the board and emergency management agencies to reduce the public hurricane shelter space deficit.

Charter schools are eligible to receive state capital outlay funding to support construction, operation, maintenance, repair or other purposes, and such facilities, when located on district property, are subject to reversion to the district school board in the event that a charter school terminates operation.

The following are factors to be considered in determining if a specific new charter school facility should incorporate the EHPA criteria: 1) are state capital outlay funds supporting the construction project; 2) does the project meet the definition of "new construction" as defined in ss. 1013.01(14), F.S. or 423.5.8, *Florida Building Code--Building*; 3) would the facility be subject to an exemption per s. 1013.372(1), F.S., due its location, size or other characteristic; 4) would the facility be subject to reversion to the district board if charter school operations terminate; or 5) will the facility be subject to use as a public hurricane shelter per s. 252.385(4)(a), F.S., because it is owned or leased by a state or local governmental entity.

4.3 State Universities

State university facilities account for only about one (1) percent of current public hurricane shelter capacity. Unlike K-12 public schools and community colleges, state university campuses may not be as widely distributed, though several are potentially located in areas with high demands for public hurricane shelter space (Florida Gulf Coast University, University of South Florida, etc.) Main campuses and some satellite campuses may have several appropriate buildings concentrated in one (or more) proximate geographic area. This concentration of shelter spaces reduces staffing and logistical resource demands of a sheltering operation.

State university facilities are normally designed for large assembly occupancies, with many having inherent mass care features. The types of university buildings that are potentially appropriate for use as public shelters include gymnasiums, field houses and sports arenas, cafeterias, multipurpose facilities, auditoriums, certain classroom buildings, etc.

State universities must consider two separate populations when developing their public shelter strategies: 1) campus staff, faculty and their families, and students (both commuters and residential); and 2) the general public. University facilities may be designated for sole use by one population, or concurrent use by both populations, at the discretion of the university board with the concurrence of local emergency management agency or the Division. Residential facilities are not normally subject to the EHPA criteria, but incorporation of the criteria into new residential housing or dormitories (or portions thereof) will free up additional hurricane shelter space for the general public in appropriate non-residential facilities.

4.4 State and Local Public Facilities

Local public facilities account for about two (2) percent of current public hurricane shelter capacity. Given their administrative function (and essential emergency function of certain facilities) most state-owned, county-owned and municipally-owned facilities are not appropriate for use as public hurricane shelters. Administrative office and support areas, data and word processing rooms and areas, record vaults, etc., are exempt from the EHPA criteria. However, certain other types of public facilities may be appropriate, such as community or civic centers, meeting halls, auditoriums, exhibition halls, sports arenas, conference or training centers, and other public assembly facilities.

5.0 RECOMMENDED SOURCES OF FUNDING

School districts have generally been reporting that the construction cost premium for incorporating the EHPA criteria is about three (3) to six (6) percent. For most new facilities, this appears to translate into a construction cost premium of less than $500,000. These are small, but not necessarily inconsequential, costs that must be borne by State and local governments. Therefore, pursuant to s. 1013.372(2), F.S., recommends use of existing state capital outlay funds to fund construction of public shelters. There is no dedicated state source of funding to support construction of EHPA's, so the Division recommends use of existing state capital outlay funds.

5.1 Public Schools, Community Colleges and University Facilities

The only significant and applicable funding source available at this time for district public schools, community colleges and universities is Public Education Construction Outlay (PECO) funds. These funds are earmarked for site acquisition and improvements necessary to accommodate buildings, equipment, and other structures of district school boards, community colleges and universities. The Division recommends the use of these because they are an appropriate and available source of State funding.

Table 5-1 provides a summary of estimated PECO funds that have been distributed to local school boards from Fiscal Year 1997/98, when the EHPA requirement was promulgated by code, through Fiscal Year 2007/08. The PECO funding information was provided by the Department of Education. Universities and community colleges are not included in Table 5-1 due to the fact that only about two (2) percent of the statewide public hurricane shelter capacity is located on their campuses. The comparison column provides a means of evaluating EHPA production versus PECO funds distributed during the thirteen (13) years that the EHPA has been a code requirement. The average PECO funds distributed per EHPA space created is $5,670. School boards with comparison values near or below this average were more productive than those that were significantly higher than either the average or have a value of zero (0).

Table 5-1. Estimate of PECO Funds Distributed to School Districts 1997 – 2010 Comparison to EHPA Spaces Created

County	New Construction PECO Funds, $	Cumulative EHPA Spaces @ 20 sf each	Ratio of PECO Funds Received to EHPA Spaces Built, $
Alachua	$13,689,553	909	$15,060.01
Baker	$3,303,969	306	$10,797.28
Bay	$12,743,041	2,275	$5,601.34
Bradford	$1,879,416	0	$0.00
Brevard	$34,339,175	15,543	$2,209.30
Broward	$184,443,426	63,843	$2,889.02
Calhoun	$964,478	0	$0.00

Table 5-1. Estimate of PECO Funds Distributed to School Districts 1997 – 2010 Comparison to EHPA Spaces Created			
County	**New Construction PECO Funds, $**	**Cumulative EHPA Spaces @ 20 sf each**	**Ratio of PECO Funds Received to EHPA Spaces Built, $**
Charlotte	$12,165,585	0	$0.00
Citrus	$10,910,548	414	$26,353.98
Clay	$40,712,028	3,185	$12,782.43
Collier	$40,485,589	13,140	$3,081.10
Columbia	$5,575,730	4,661	$1,196.25
DeSoto	$2,414,272	453	$5,329.52
Dixie	$1,388,354	252	$5,509.34
Duval	$50,761,462	16,408	$3,093.70
Escambia	$16,956,713	2,434	$6,966.60
Flagler	$25,476,339	1,178	$21,626.77
Franklin	$507,654	0	$0.00
Gadsden	$3,317,022	2,535	$1,308.49
Gilchrist	$1,604,565	0	$0.00
Glades	$823,387	649	$1,268.70
Gulf	$1,524,961	228	$6,688.43
Hamilton	$983,128	1,199	$819.96
Hardee	$2,890,964	6,168	$468.70
Hendry	$3,592,162	1,000	$3,592.16
Hernando	$25,249,589	10,144	$2,489.12
Highlands	$7,597,367	8,021	$947.18
Hillsborough	$145,844,289	78,541	$1,856.92
Holmes	$1,484,783	1,035	$1,434.57
Indian River	$11,338,760	1,746	$6,494.14
Jackson	$4,645,987	2,237	$2,076.88
Jefferson	$615,491	809	$760.80
Lafayette	$951,389	0	$0.00
Lake	$45,040,584	28,635	$1,572.92
Lee	$70,798,993	23,059	$3,070.34
Leon	$16,774,739	1,245	$13,473.69
Levy	$4,033,620	276	$14,614.57
Liberty	$1,392,240	776	$1,794.12
Madison	$1,265,618	0	$0.00
Manatee	$31,819,893	25,295	$1,257.95
Marion	$37,872,640	6,558	$5,775.03
Martin	$13,407,274	7,863	$1,705.11
Miami-Dade	$180,055,515	28,261	$6,371.17
Monroe	$3,304,335	363	$9,102.85
Nassau	$9,547,176	3,425	$2,787.50
Okaloosa	$11,048,934	2,025	$5,456.26

Table 5-1. Estimate of PECO Funds Distributed to School Districts 1997 – 2010 Comparison to EHPA Spaces Created

County	New Construction PECO Funds, $	Cumulative EHPA Spaces @ 20 sf each	Ratio of PECO Funds Received to EHPA Spaces Built, $
Okeechobee	$3,724,303	1,011	$3,683.78
Orange	$123,498,036	27,316	$4,521.09
Osceola	$61,043,263	7,328	$8,330.14
Palm Beach	$113,927,836	51,856	$2,197.00
Pasco	$74,299,046	21,008	$3,536.70
Pinellas	$61,320,950	17,602	$3,483.75
Polk	$86,231,095	39,414	$2,187.83
Putnam	$5,079,243	1,243	$4,086.28
St. Johns	$42,032,738	8,241	$5,100.44
St. Lucie	$56,302,558	5,390	$10,445.74
Santa Rosa	$22,306,259	7,413	$3,009.07
Sarasota	$34,599,582	38,698	$894.09
Seminole	$37,076,435	1,000	$37,076.44
Sumter	$2,685,199	200	$13,426.00
Suwannee	$4,300,520	3,484	$1,234.36
Taylor	$1,923,026	2,424	$793.33
Union	$1,357,200	411	$3,302.19
Volusia	$34,271,387	11,460	$2,990.52
Wakulla	$5,581,785	800	$6,977.23
Walton	$5,739,252	5,217	$1,100.11
Washington	$3,126,912	1,455	$2,149.08
Statewide Total	**$1,877,969,362**	**620,065**	**$5,670.16**

* - Spaces shown have been adjusted to reflect Persons with Special Needs (PSN) space capacity at an equivalent rate of three (3) times the general population spaces (i.e., 1 PSN space @ 60 sf each = 3 GP spaces @ 20 sf each). Note: $5,670 is an average of the ratios, less those with a value of "$0".

The Department of Education also reported that under the Classrooms for Kids (CFK) program the state has distributed an additional $2.5 Billion in capital outlay funds. The CFK funds are allocated to reduce class sizes and can be used for construction, renovation, remodel or repair of permanent facilities, or purchase or lease-purchase of relocatables. Since some of these activities are not subject to EHPA code requirements they have not been included in Table 5-1. The CFK funds were derived from Lottery proceeds, General Revenue and PECO funds.

5.2 Department of Management Services Facilities

The Department of Management Services (DMS) has reported that the premium costs associated with constructing to the EHPA criteria can be included in existing funding sources. If the additional cost of adding emergency shelter capabilities to a new

DMS building is not very large (e.g., less than five percent) such that the project remains financially supportable by the rental rate, then the EHPA-related cost premium can be included in the overall construction amount financed via bond issue.

Alternatively, the additional cost can be added to the General Revenue component of the project funding request. Although the construction of buildings may be financed, some general revenue funding must be included in the overall budget request for various non-construction costs such as architectural and engineering fees, land acquisition and impact assessments. The funding for non-standard items (e.g. equipment, ancillary facilities) are also typically included as general revenue in request.

5.3 Mitigation Funds

From time to time, some Federal and State mitigation-related funds may be available to support the construction cost premium for improving hurricane-resistance **above** minimum code requirements for new facilities. By example, some mitigation programs may share the cost of increasing the design wind speed by the EHPA criteria's recommended 40 miles per hour increase in design wind speed or to the ICC 500 hurricane wind design standards. The principal Federal/State mitigation program is the Hazard Mitigation Grant Program (HMGP). However, the HMGP is not considered "available" for most new construction projects because its grant cycles are often tied to Federal disaster declarations. The HMGP also has a pre-disaster mitigation (PDM) grant cycle which is nationally competitive. Information on the mitigation programs can be obtained through state and local emergency management agencies.

6.0 STATEWIDE PROGRESS TOWARD ELIMINATING THE PUBLIC HURRICANE EVACUATION SHELTER SPACE DEFICIT

The Florida Division of Emergency Management is charged under 252.385 of the Florida State Statutes to administer a statewide program to eliminate the deficit of "safe" hurricane shelter space. The Division has taken several steps to implement the program. First, by conducting a survey of existing buildings, both public and private, to identify suitable shelter capacity. Second, where cost effective (and practical), support mitigation and retrofitting of facilities to increase shelter capacity. Third, by requiring construction of new facilities to meet the EHPA criteria. Fourth, conduct research to clearly identify demand, and finally improve public information/education to reduce shelter demand from evacuees not required to evacuate or "shadow" evacuations.

Since 1995, the Division has been performing a survey of existing designated and potential hurricane shelters. The initial findings of the survey were not encouraging. The vast majority of the designated hurricane shelters were in buildings that did not meet the ARC 4496 guidelines. As examples, the pre-survey designated hurricane shelters rarely had adequate (if any) window protection (83 percent), and were often constructed with long span roofs (41 percent) and unreinforced masonry walls (43 percent). The initial results of the survey began, for the first time, to quantify the actual condition of Florida's hurricane shelter inventory, instead of relying on anecdotal concerns that had been expressed for more than 20 years. However, during the survey process, hundreds of thousands of spaces were identified that only required minor retrofitting (e.g., window protection) to meet the ARC 4496 guidelines.

Between 1995 and 2000, the reported hurricane shelter space deficit increased considerably; from about 361,000 in 1996 to more than 1.5 million in 2000. During this time-frame, less than 200,000 hurricane shelter spaces could be documented, primarily in the southeastern and east-central coastal regions of the state. This capacity was principally the result of post-Hurricane Andrew HMGP funding of public school window protection projects. No other significant source of funding had been identified to support the minor retrofit projects being documented during the survey process.

Concurrently, s. 235.26(9)(a), F.S. (superseded by 1013.372(1), F.S.) stated that all new educational facilities for which a design contract was entered into after July 1, 1995 were required to incorporate the public shelter design criteria. However, the criteria did not become effective until April 28, 1997. It is also not unusual for there to be a three-year delay between promulgation and availability of the first group of compliant facilities. Therefore, minimal progress was made prior to 2000 via construction of new public schools to the EHPA criteria.

By 2000, the reported hurricane shelter space deficit peaked as the strategy originally directed by Chapter 93-211, Laws of Florida, began to produce results. As a benchmark, the *2000 Statewide Emergency Shelter Plan* reported that Florida had a statewide hurricane shelter space deficit of more than 1.5 million spaces. This reported deficit affected every region of the state, but especially the southern and central regions

of the peninsula. This did not imply that in any given storm that 1.5 million evacuees would simultaneously seek public shelter, but reflects the State's cumulative hurricane shelter space deficit. State and local emergency managers and other public officials prefer that persons ordered to evacuate for a hurricane stay within their home county or region, and not evacuate long distances. The *2000 Statewide Emergency Shelter Plan's* published statewide and regional deficits served to quantify the challenge that lay ahead.

In 1999, the State Legislature appropriated more than $2.2 million to support a hurricane shelter retrofitting initiative. The appropriation stipulated that the funds be used to shutter school buildings for use as hurricane shelters. The Division used the *1999 Shelter Retrofit Report* to identify and prioritize projects to receive the funds. A total of 58 projects were selected, which created an estimated 34,928 spaces. In 2000, the State Legislature appropriated an additional $18 million (combined Federal, State and local funds) to complete the projects listed in the *1999 Shelter Retrofit Report*. The 2000 appropriation included funds from the Hurricane(s) Floyd and Irene (Federal HMGP declaration), which were earmarked to support the state's effort to reduce the deficit of hurricane shelter space.

The *2009 Shelter Retrofit Report* can provide additional information concerning Florida's hurricane shelter survey and retrofit program. The *2009 Shelter Retrofit Report* can be viewed at the following web address:

http://www.floridadisaster.org/Response/engineers/library.htm

Since 1995, through Federal, State, and local retrofitting of suitable facilities, Florida has created a total of 471,764 public hurricane shelter spaces. The "Retrofitted / Mitigated Capacity Gained" column of Table 6-1 demonstrates county-by-county progress toward eliminating the hurricane shelter space deficit by retrofitting appropriate facilities to meet ARC 4496. Retrofitted facilities account for about 42 percent of the state's total capacity of ARC 4496 hurricane shelter spaces. The majority of this retrofit capacity has been created since 1999. Though regions and counties with the greatest deficits received priority for available retrofit funds, there has been a more widespread distribution of the retrofit funds due to the statewide nature of the deficit. Some of the retrofitted facilities have less than preferred mass care characteristics (e.g., inconveniently located toilet facilities, etc.), but the retrofit program produced a rapid improvement in the safety of Florida's hurricane shelter inventory.

Creation of hurricane shelter capacity through construction of new school facilities to the EHPA criteria has also increased since 1999. Local emergency management and school board officials have reported that 574,633 EHPA shelters spaces have been created. The "EHPA Capacity Gained" column of Table 6-1 demonstrates county-by-county progress toward eliminating the hurricane shelter space deficit via EHPA construction. The application of the EHPA criteria has been inconsistent across the state, with several counties reporting construction of relatively few (if any) EHPA's. EHPA spaces account for about 52 percent of the state's total capacity of ARC 4496 hurricane shelter spaces. However, as with any program, "institutionalization" takes time to evolve, and progress is being made.

Some 66,661 spaces were identified through surveys as meeting ARC 4496 guidelines ("as-is") without further retrofitting needed. These facilities however, did not meet all the EHPA code requirements. These Pre-Mitigation ARC 4496 spaces account for about 6 percent of the state's total spaces.

Since 1995, the Division's hurricane shelter survey and retrofit program has directly or indirectly led to identification or creation of 538,425 hurricane shelter spaces that meet ARC 4496 guidelines. The EHPA construction program has created about 574,633 hurricane shelter spaces. Therefore, by the 2010 hurricane season, Florida will have a total of 1,113,058 shelter spaces that meet ARC 4496 guidelines.

TABLE 6-1

Totals Per County	Pre-Mitigation ARC 4496 Capacity (persons)	EHPA Capacity Gained (persons)	Retrofitted / Mitigated Capacity Gained (persons)	Total ARC 4496 (Non-SpNs) Spaces
ALACHUA	0	0	6,451	6,451
BAKER	0	306	2,170	2,476
BAY	0	1,378	16,321	17,699
BRADFORD	0	0	1,462	1,462
BREVARD	1,241	10,854	29,823	41,918
BROWARD	500	58,693	0	59,193
CALHOUN	0	0	0	0
CHARLOTTE	0	0	3,127	3,127
CITRUS	253	0	4,498	4,751
CLAY	0	2,885	3,053	5,938
COLLIER	0	11,958	13,178	25,136
COLUMBIA	0	4,661	0	4,661
DESOTO	0	0	2,542	2,542
DIXIE	0	0	2,051	2,051
DUVAL	1,092	13,654	29,236	43,982
ESCAMBIA	254	2,434	12,814	15,502
FLAGLER	1,677	650	1,803	4,130
FRANKLIN	0	0	0	0
GADSDEN	0	2,535	2,382	4,917
GILCHRIST	0	0	3,243	3,243
GLADES	0	319	493	812
GULF	232	228	0	460
HAMILTON	0	896	501	1,397
HARDEE	0	5,838	0	5,838
HENDRY	939	1,000	4,372	6,311
HERNANDO	0	8,146	1,117	9,263
HIGHLANDS	1,136	8,021	747	9,904
HILLSBOROUGH	446	76,291	25,560	102,297
HOLMES	0	921	179	1,100
INDIAN RIVER	75	0	8,317	8,392
JACKSON	0	2,138	896	3,034

TABLE 6-1				
Totals Per County	**Pre-Mitigation ARC 4496 Capacity (persons)**	**EHPA Capacity Gained (persons)**	**Retrofitted / Mitigated Capacity Gained (persons)**	**Total ARC 4496 (Non-SpNs) Spaces**
JEFFERSON	0	809	0	809
LAFAYETTE	0	0	570	570
LAKE	0	27,567	2,555	30,122
LEE	10,093	17,959	7,370	35,422
LEON	822	1,245	20,331	22,398
LEVY	70	276	2,127	2,473
LIBERTY	0	548	602	1,150
MADISON	0	0	4,487	4,487
MANATEE	0	22,301	17,996	40,297
MARION	0	6,192	6,035	12,227
MARTIN	7,815	5,079	9,498	22,392
MIAMI-DADE	5,052	26,761	72,589	104,402
MONROE	0	0	602	602
NASSAU	0	3,095	278	3,373
OKALOOSA	6,430	2,025	5,339	13,794
OKEECHOBEE	0	1,011	1,928	2,939
ORANGE	1,671	24,451	0	26,122
OSCEOLA	0	4,823	18,327	23,150
PALM BEACH	0	51,106	6,880	57,986
PASCO	1,000	19,250	13,949	34,199
PINELLAS	17,482	15,187	12,900	45,569
POLK	1,007	37,452	622	39,081
PUTNAM	0	811	1,065	1,876
SANTA ROSA	383	7,413	5,131	12,927
SARASOTA	0	28,459	16,954	45,413
SEMINOLE	0	1,000	14,593	15,593
ST.JOHNS	0	6,741	4,781	11,522
ST.LUCIE	3,584	4,388	8,913	16,885
SUMTER	0	200	344	544
SUWANNEE	0	3,484	0	3,484
TAYLOR	0	2,424	1,202	3,626
UNION	0	312	939	1,251
VOLUSIA	2,145	8,952	13,861	24,958
WAKULLA	0	800	0	800
WALTON	1,262	5,217	1,904	8,383
WASHINGTON	0	1,023	3,469	4,492
Totals- General Pop	**66,661**	**552,167**	**454,477**	**1,073,305**
Totals SpNS	**0**	**22,466**	**17,287**	**39,753.00**
Grand Total	**66,661**	**574,633**	**471,764**	**1,113,058**

Through research Florida has been able to increase its understanding of shelter demand. By more accurately identifying demand the State is able to plan for anticipated need thus reducing its hurricane shelter deficit. Through the technologies applied to this effort such as Light Detection And Ranging (LIDAR), and improved SLOSH computer models, the Division is able to more precisely determine which areas are vulnerable to hurricane storm surge. These improved techniques, are the results of a new hurricane evacuation studies program.

The application of the data in the new storm tide atlases and hurricane evacuation studies, will allow local emergency management officials to refine their designated evacuation zones for each storm scenario, increase accuracy in vulnerability assessments means that evacuation areas represent a more precise number of people at risk. Increased accuracy, and education combined with a high level of behavioral analysis will yield a better picture of the number of shelter space actually needed. Two examples of this application are Broward and Miami-Dade counties. Through its LIDAR project, Broward County was able to reduce its number of hurricane evacuees by about 250,000 residents, which reduced anticipated shelter demand by an estimated 37,500 spaces. Miami-Dade County was also able to reduce its evacuation zones through more precise ground surveys. Its new evacuation zones reduce the number of those who will be ordered to evacuate by approximately 395,000, which also reduced anticipated shelter demand by an estimated 59,250 spaces. Hurricane shelter demand estimates have also been reduced through adjustments to reflect current census information (i.e., 2000 census vs. 1990 census), in the methodology of Hurricane Evacuation Studies.

Historically, 25 percent or more of the estimated evacuating population were projected to seek safety in public shelters. Many of the post-1998 Hurricane Evacuation Studies are now indicating that fewer than 15 percent will seek public shelter for a Category 5 hurricane. The 2004 hurricane season provides an example of relatively low public shelter use. Though none of the storms made landfall as a Category 5 hurricane, two storms approached Florida at near Category 5 strength before making landfall as a Category 3 and 4; (Hurricane Ivan and Hurricane Charley respectively). During Hurricane Ivan, an estimated 544,900 persons were under evacuation orders and only 33,472 evacuees were housed in public shelters (6 percent). During Hurricane Charley, although it rapidly intensified only few hours before landfall, there were an estimated 2.7 million persons under evacuation orders and only 102,094 evacuees were housed in public shelters (3.75 percent). While these examples are not evidence of a decrease in demand they do show that under many circumstances public shelter demand is lower.

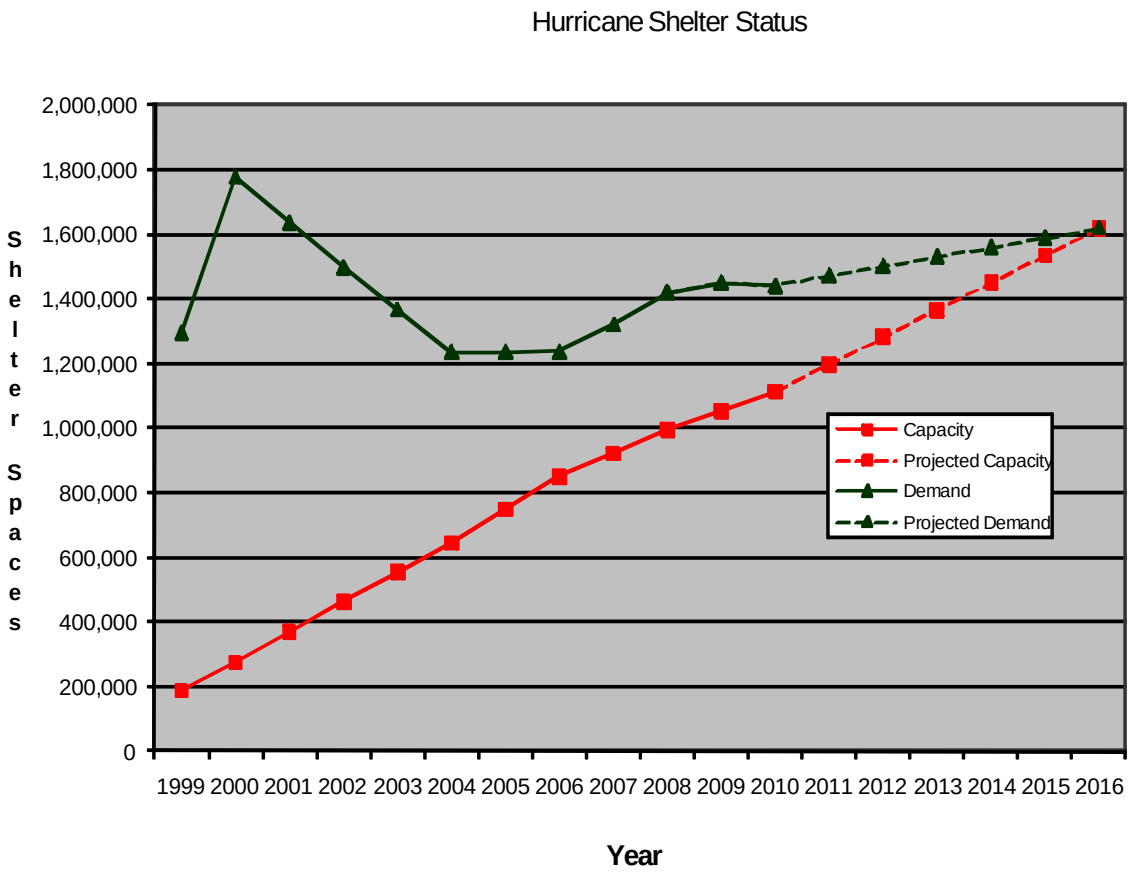
Since publication of the *2000 Statewide Emergency Shelter Plan*, the statewide average estimated demand has fallen from about 24 percent to about 19 percent. The practical effect is an apparent reduction in hurricane shelter space demand since 2000, although in reality this means federal, state and local agencies do not have to invest public funds to create the additional “bricks-and-mortar” shelter spaces. Currently, the Division has ongoing contracts to conduct LIDAR studies and Hurricane Evacuation Studies for all 11 Regional Planning Council (RPC) regions. The final study results were not completed in time for this document, but are expected in early 2010, and will be utilized in subsequent Plans.

The Division has also developed a public information program to compliment the other hurricane shelter deficit reduction efforts. The Division educates residents on the hazards they face and how to best deal with them. A key issue is whether or not to evacuate and, if so, to where. Education on the hazards and how they affect a community lead to residents making better-informed decisions in a crisis. That effort is being supported by public service announcements, hurricane expositions, training of local responders and volunteers, and through emergency messages during times of crisis. This is expected to be a long-term process that will help to reduce the need for public hurricane shelter space.

As seen in Table 6-1, since 1995 the Division's hurricane shelter survey and retrofit program has identified, created or otherwise documented 538,425 hurricane shelter spaces that meet ARC 4496 guidelines. Public school new construction programs have created an additional 574,633 hurricane shelter spaces. Therefore, by the 2010 hurricane season, Florida will have a total of 1,113,058 shelter spaces that meet ARC 4496 guidelines. The demand for hurricane shelter space has also been significantly reduced over the past nine years due to improvements in public information, storm hazard models and more accurate census data. Since 2000, Florida's deficit of hurricane shelter space has been reduced by about 72 percent, and based on current trends the Division estimates that about 84,000 spaces will be added to the state's inventory each year. As demonstrated in Figure 6-1, the Division estimates that the hurricane shelter space deficit may be eliminated by 2016.

Since publication of the *2000 Statewide Emergency Shelter Plan*, Florida now has 28 counties with demonstrable surpluses of hurricane shelter space. The counties with surpluses include: Bay, Brevard, Broward, Escambia, Gadsden, Gilchrist, Hardee, Hernando, Highlands, Indian River, Lake, Leon, Liberty, Madison, Manatee, Martin, Miami-Dade, Okaloosa, Orange, Osceola, Palm Beach, St. Johns, St. Lucie, Santa Rosa, Seminole, Taylor, Walton, and Washington. Also, five regions have a demonstrable surplus of hurricane shelter space

Figure 6-1. Projected Hurricane Shelter Deficit Reduction



Note: The "spike" in shelter demand between 1999 and 2000 is an aberration primarily due to the introduction of new census data in 2000 (1999 value of shelter demand is based on 10 year old census data.)

7.0 CONCLUSIONS

As a result of Hurricane Andrew and the Lewis Commission Report, the State of Florida recognized the necessity of providing safe hurricane shelter space for its residents during disasters. In support of this goal, the Division, every two years, submits to the Governor and Cabinet, the *Statewide Emergency Shelter Plan.* The Plan provides a listing of facilities recognized as meeting public shelter hurricane safety criteria, public hurricane shelter spaces (and square footage) versus estimated shelter demand for each county, Regional Planning Council Region, and the State overall.

The 2010 Plan shows significant progress in reducing the deficit of "safe" public hurricane shelter space in Florida. Since 1995, more than 1,113,058 hurricane shelter spaces have been identified, and created through retrofitting of existing buildings, or through new construction (e.g., EHPAs). As the Division continues to map Florida's coastlines through LIDAR mapping and other improved topographic survey techniques, it is estimated that the public hurricane shelter demand will be reduced to 1,439,811 spaces for 2010. In contrast, there was an estimated shelter demand of 1,776,606 shelter spaces in 2000. Despite an increasing state population, the overall State public hurricane shelter deficit continues to shrink.

Lastly, if the current rate of shelter space production is maintained, the State's public hurricane shelter deficit should be eliminated by 2016. This, however, cannot be achieved unless we maintain current designated hurricane shelter buildings and replace facilities that will over the years be decommissioned due to age and other issues (e.g., more preferred alternatives available, etc.) Thus, even once the deficit is eliminated, a "maintenance level" of shelter space production will be necessary to avoid falling back into a deficit situation.

APPENDIX