EXECUTIVE SUMMARY

Annually the State of Florida is subject to the potentially catastrophic impact of a major hurricane striking a heavily-populated area anywhere in the state. Shelter surveys and evacuation studies have determined that significant hurricane shelter space deficits exist in nearly all regions of the state. These regional deficits can have a significant impact on the ability of local agencies to protect citizenry when a major hurricane threatens or strikes Florida.

Pursuant to section 1013.372(2), Florida Statutes, the Department of Community Affairs (the Department) is responsible for preparing a *Statewide Emergency Shelter Plan* (the Plan) to guide local planning and provide consultative assistance with the construction of educational facilities to provide public shelter space. The purpose of this Plan is to meet the statutory responsibility outlined in section 1013.372(2), Florida Statutes. The Plan is prepared and submitted for approval on a biennial basis and, once approved by the Governor and Cabinet, will determine which Regional Planning Council (RPC) regions and counties will need to construct new school facilities that must comply with the public shelter design criteria. 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 2006 and 2011 regional hurricane shelter space demands, capacities and their respective statuses as regions with a surplus or deficit. At this time, only four (4) RPC regions have a surplus of hurricane shelter space in 2006: 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 2, 10 and 11 through 2011; RPC region 6 will experience a deficit in 2011, but only if there are no additional shelter capacity created. All other regions have hurricane shelter space deficits, and per section 1013.372(1), Florida Statutes, their district school boards, community colleges and universities are required to construct all new educational facilities in compliance with the public shelter design criteria.

Table EX-1.
Regional Summaries of Hurricane Shelter Demand, Capacities, and Deficits/Surpluses for 2006 through 2011
General Population and Special Needs Shelters

RPC Region	RPC Region Name	General Population Shelter Demand and Capacities					Special Needs Shelter Demand and Capacities				
		2006 Cat. 5 Shelter Demand, persons	2011 Cat. 5 Shelter Demand, persons	2006 Shelter Capacity, persons	2006 Shelter Surplus/ (Deficit), persons	2011 Shelter Surplus/ (Deficit), persons	2006 Cat. 5 Shelter Demand, clients	2011 Cat. 5 Shelter Demand, clients	2006 Shelter Capacity, clients	2006 Shelter Surplus/ (Deficit), clients	2011 Shelter Surplus/ (Deficit), clients
1	West Florida (WF)	63,643	68,752	42,776	(20,867)	(25,976)	2,072	2,542	2,197	125	(345)
2	Apalachee (APAL)	21,924	23,017	30,444	8,520	7,427	835	1.004	491	(344)	(513)
3	North Central Florida (NCF)	34,839	37,723	27,787	(7,052)	(9,936)	629	769	624	(5)	(145
4	Northeast Florida (NEF)	77,791	86,372	46,305	(31,486)	(40,067)	1,675	2,159	1,851	176	(308)
5	Withlacoochee (WITH)	42,471	47,363	18,944	(23,527)	(28,419)	1,386	1,646	1,181	(205)	(465)
6	East Central Florida (ECF)	93,102	103,999	101,364	8,262	(2,635)	3,285	3,964	5,473	2,188	1,509
7	Central Florida (CF)	101,594	109,530	50,257	(51,337)	(59,273)	1,572	1,799	332	(1,240)	(1,467)
8	Tampa Bay (TB)	329,879	355,186	180,297	(149,582)	(174,889)	2,827	3,219	5,737	2,910	2,518
9	Southwest Florida (SWF)	275,413	311,148	118,090	(157,323)	(193,058)	2,556	3,024	2,441	(115)	(583)
10	Treasure Coast (TC)	64,000	70,863	84,797	20,797	13,934	1,573	1,843	2,207	634	364
11	South Florida (SF)	106,430	113,108	123,646	17,216	10,538	1,265	1,476	4,230	2,965	2,754
	TOTALS	1,211,086	1,327,061	824,707	(386,379)	(502,354)	19,675	23,445	26,764	7,089	3,319

With publication of the 2006 Plan, the Department is also monitoring the status of the statewide inventory of Special Needs Shelters (SpNS). Historically, SpNSs have been included in total population hurricane shelter demand estimates, hurricane shelter capacities and surplus/deficit results. However, given the findings of the 2004 hurricane season that about half of the designated SpNSs were located in facilities that did not meet the same minimum safety criteria as general population shelters, the Department was asked to separate the two shelter types and monitor progress towards improving SpNS safety, client capacity and provision of emergency power supported air-conditioning. As can be seen in Table EX-1, the SpNS client safety and capacity situation has improved with only five (5) regions currently having client space deficits. A surplus of SpNS space exists on a statewide basis.

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.

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

During preparation of this Plan, the Department conducted a survey to estimate the compliance rate of school districts with meeting statutory and code requirements to incorporate the public shelter design criteria into all new school facilities, unless lawfully exempted with the written concurrence of local emergency management or the Department. In the Auditor General's Report No. 02-055 (2001), there was a finding that of the new schools reviewed, only 65 percent appeared to comply with the law. The Department wanted to determine if compliance had improved since 2001. According to the Florida Inventory of School Houses (FISH) data, there were 1,708 new school buildings constructed between 2000 and 2005, with an estimated total net usable floor area of 50,718,368 square feet. The Division recognizes 302 facilities (12,510,243 square feet) as meeting the requirements of the law, and another 565 buildings (16,018,645 square feet) were lawfully exempt for statutory and code accepted causes. Therefore, only about 867 of 1,708 new buildings complied with statutory and code EHPA requirements.

Since the 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 22,189,480 square feet, or a non-compliance rate of about 44 percent. The result of the survey indicates that compliance has not improved. There was sufficient square footage in the non-compliant new buildings to have substantially reduced Florida's current hurricane shelter space deficit. Clearly more needs to be accomplished to improve compliance with the EHPA statutory and code requirements.

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 Department recommend an appropriate and available source of funding for the additional cost of constructing emergency shelters. There is no dedicated state source of funding to support new hurricane shelter construction, so the Department recommends use of existing state capital outlay funds.

The only significant and appropriate funding source available at this time for public schools, community colleges and universities is Public Education Construction Outlay (PECO) funds. Therefore, the Department recommends PECO funds. 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 $1,298,044,400 in new construction funds to district school boards since promulgation of the public shelter requirement into code in 1997. Other state sources of school 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 Department's Division of Emergency Management (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

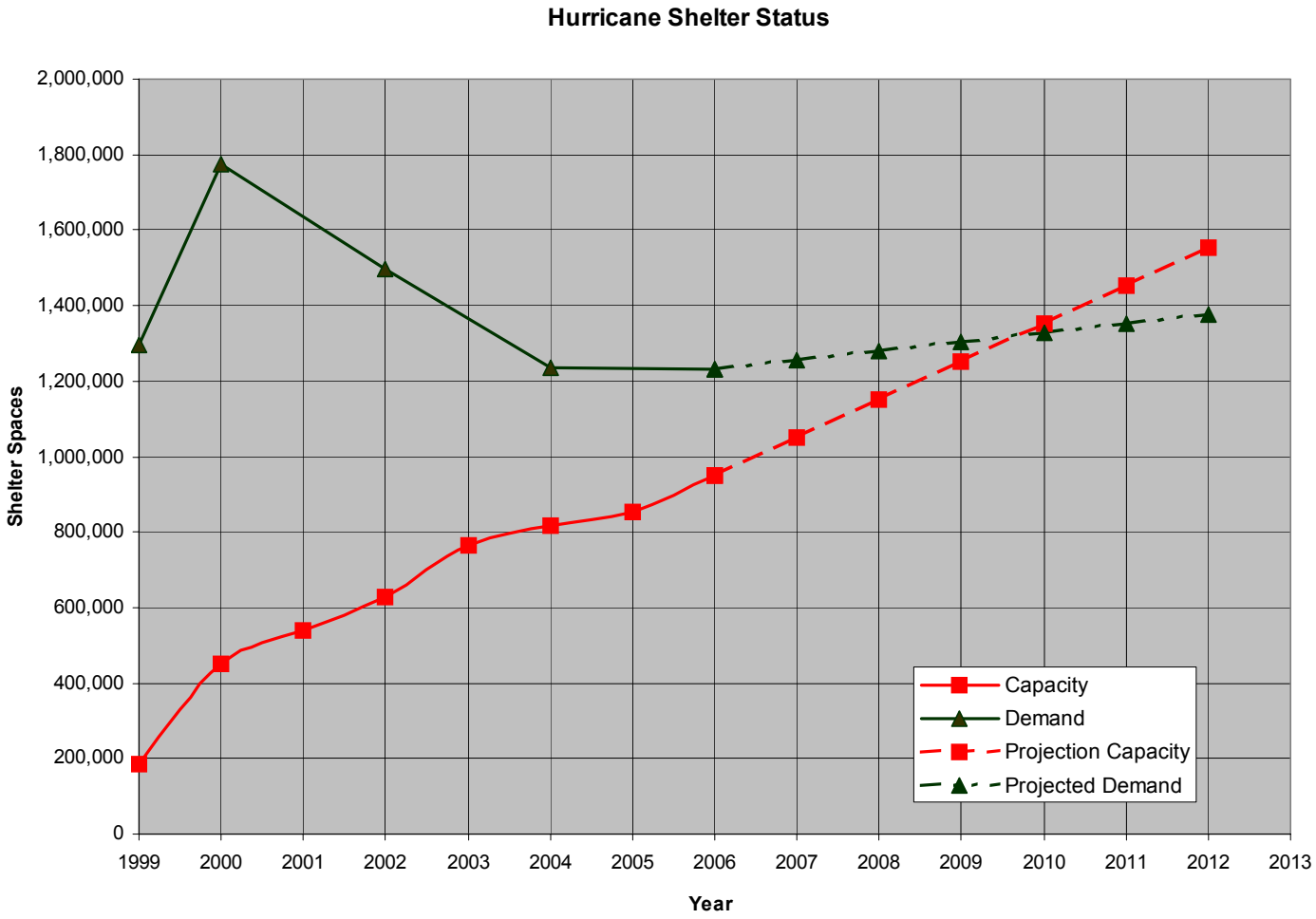
reduction through improved hurricane hazard models and behavioral studies; and, 5) improve public information/education to reduce unnecessary "shadow" evacuations.

Since 1995, the Division's hurricane shelter survey and retrofit program has identified, created or otherwise documented 474,772 hurricane shelter spaces that meet ARC 4496 guidelines. Public school new construction programs have created an additional 376,699 hurricane shelter spaces. Therefore, by the 2006 hurricane season, Florida will have a total of about 851,471 shelter spaces that meet ARC 4496 guidelines. The demand for hurricane shelter space has also been significantly reduced over the past five 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 75 percent, and based on current trends the Division estimates that about 100,000 spaces will be added to the state's inventory each year. As can be seen in Figure EX-1, the Department estimates that the hurricane shelter space deficit may be eliminated by 2010.

Since publication of the *2000 Statewide Emergency Shelter Plan*, Florida now has 23 counties with demonstrable surpluses of hurricane shelter space. The counties with surpluses include Brevard, Broward, Gilchrist, Hamilton, Hendry, Holmes, Indian River, Lake, Leon, Liberty, Madison, Manatee, Martin, Miami-Dade, Palm Beach, Osceola, St. Johns, St. Lucie, Seminole, Taylor, Union, Walton, and Washington. Also, four regions have a demonstrable surplus of hurricane shelter space.

As Florida's hurricane vulnerable population continues to grow, it is vitally important that construction of hurricane shelters and retrofitting of existing buildings be considered a priority. If this state is to meet its goal of eliminating the hurricane shelter space deficit, the incorporation of the public shelter design criteria into new construction, improvements in EHPA compliance by school districts, retrofitting of suitable existing buildings and continued use of new technologies must continue to be accomplished. The overall result of full implementation of the Department'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 victims.

Figure EX-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.)

1.0 INTRODUCTION

1.1 Purpose of Statewide Emergency Shelter Plan

Pursuant to section 1013.372(2), Florida Statutes (F.S.), the *Statewide Emergency Shelter Plan,* hereafter referred to as the 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 shelters by region and county; the general location and square footage of needed 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 Department has routinely received requests for guidance on certain aspects of the criteria. Therefore, based upon standard responses, this Plan also includes consultative guidance by the Department on subjects relating to implementation of the criteria; 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 145 miles per hour spread inland, causing catastrophic damage in some areas of south 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

citizens 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 concerns by the Governor's Disaster Planning and Response Review Committee, 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 writing 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, Florida Statutes. Based on those revisions, the Legislature clearly stated its intent that Florida not have a deficit of safe public hurricane shelter space in any region of the state.

One of the statutory revisions required that the Department of Education, in consultation with boards and county and state emergency management offices, develop standards for a public shelter design criteria, which were to be 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 Department.

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, district school boards and shelter operations experts from 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 (see Appendix B). Subsequently, along with other sections of SREF, the criteria were incorporated in Chapter 423 of the Florida Building

Code (FBC), which became effective March 1, 2002. This provided a seamless continuation of the criteria for new school construction projects.

The sheltering lessons learned from Hurricane Andrew were further reiterated by the experiences of 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. Nearly every county in Florida was under hurricane or inland high wind warnings, prompting mandatory evacuation orders for their storm surge and 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 shelters is a statewide challenge. Cumulatively, even if a small number of counties have shelter space surpluses, deficits in any county have statewide implications that must be addressed, at a minimum, at the regional level. Evacuees that cannot find shelter space within their own county or region will leave those areas in search of viable shelter alternatives elsewhere. Implementation 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, construction 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.

In s. 252.38, F.S., the Legislature states 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 upon county governing boards (i.e., Boards of County Commission). To expand and expedite locally available resources to meet an emergency situation, the Legislature directed that during a declared state or local emergency, district school 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 in most cases, public schools will be opened as shelters regardless of the storm's 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) 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 [1]Board of Regents, 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.

(4)(a) Public facilities, including schools, postsecondary education facilities, and other facilities owned or leased by the state or local governments, but excluding hospitals or 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. Such agencies shall coordinate with the appropriate school board, university, community college, or local governing board when requesting the use of such facilities as public hurricane evacuation shelters.

In s. 252.385, F.S., the Legislature stated its intent to eliminate the deficit of "safe" public hurricane shelter space. The Department's Division of Emergency Management (the Division) was given both the responsibility and authority to administer a statewide program to survey public facilities to identify those that are appropriately designed and located to serve as public shelters. The owners of the facilities to be surveyed are responsible for coordinating and implementing the survey with the Division and applicable local emergency management agencies.

To ensure consistency with state and national standards, guidelines and "best practices," the Division has recognized 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. The public hurricane shelter capacities listed as suitable in this Plan are recognized by the Department as meeting ARC 4496 safety criteria. The capacity lists include 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 initiating need (known or perceived hazards and risks), location, available staffing resources, internal/external movement circulation, availability of adequate toilets and sanitation, feeding capabilities, emergency power, types of spaces available and their configuration and contents, type of roof covering and condition, etc. When anticipated demand exceeds available capacity of ARC 4496 space, local emergency managers select other facilities that afford the best available protection.

In s. 252.385(4)(a), F.S., the Legislature directs that all suitable public facilities owned or leased by state or local government agencies shall be made available for use as a public hurricane shelter 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.

In s. 1013.372(1), F.S., the Legislature directed the Department of Education 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, FBC), 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. The criteria were subsequently incorporated into the FBC on March 1, 2002.

The statute indicates that a board may exempt a facility from the criteria due to location, size or other characteristics that cause the facility to be inappropriate for use as a public shelter, with the concurrence of the applicable local emergency management agency or the Department. A facility that is located, or proposed to be located, in a Regional Planning Council region that is determined by the Department 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 Department.**

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.

In s. 1013.74(4), F.S., state university boards of trustees have statutory authorities and responsibilities similar to 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 FBC's public shelter design criteria. The Department recommends use of the FBC'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 Department. A facility that is proposed to be located in a Regional Planning Council region that is determined by the Department 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 Department.

381.0303(2) Special Needs Shelter Plan and Staffing. --

(c) Local emergency management agencies shall be responsible for the designation and operation of special needs shelters during times of emergency or disaster. County health departments shall assist the local emergency management agency with regard to the management of medical services in special needs shelters.

In section 381.0303(2), local emergency management agencies are given the statutory responsibility of designating and operating Special Needs Shelters (SpNS). The Department of Health through County Health Departments is given the responsibility to assist with managing the medical service needs of the clients. The Division strongly encourages local emergency managers to designate SpNS facilities that at a minimum 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 the 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, and secondarily the social and recreational purposes of the community. Though the hurricane shelter function is considered a secondary function of a public school facility, 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 were prepared to ensure that new educational facilities could meet or exceed applicable national design and construction standards, guidelines and "best practices." The EHPA criteria were also developed to significantly enhance the occupant safety of public hurricane shelters, and enhance their ability to survive and continue to serve the public after exposure to a major hurricane.

In particular, the American Red Cross' ARC 4496 must be consulted during the planning process for an EHPA; see Appendix C. ARC 4496 is the minimum hurricane shelter selection guideline used by the Department, 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://floridadisaster.org/bpr/Response/engineers/documents/newarc4496.pdf

The criteria require that EHPAs be designed, constructed and certified as capable of withstanding wind loads according to the American Society of Civil Engineers Standard 7 (ASCE 7). The criteria also highly recommend increasing the design map wind speed by 40 miles per hour. The Department also highly recommends the 40 mile per hour increase in map wind speed, especially if the EHPA is constructed with tall exterior walls, long span lightweight roof systems, wide roof overhangs, located in open areas with minimal sheltering, etc., which are particularly vulnerable to damage from severe winds.

For additional consultative 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, etc., please see Appendix G. The Department also recommends two other useful sources of information which should be considered in

the EHPA design process: 1) the Department of Energy's (DOE) Standard *Natural Phenomena Hazards Design and Evaluation Criteria* (DOE-STD-1020), and 2) the Federal Emergency Management Agency's (FEMA) publication *Design and Construction Guidance for Community Shelters* (FEMA 361).

The Department recommends that SpNS's also meet the same hurricane safety criteria as general population shelters. That is, at a minimum, the designated SpNS should meet ARC 4496, and preferably meet the FBC's public shelter design criteria. However, findings from the 2004 hurricane season indicated that only about half of the designated SpNS's met the minimum 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

In the wake of the 2004 hurricane season, the Governor, the Department and its Division of Emergency Management and the Department of Health distributed 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 emergency 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). For further guidance, please see the following memorandum dated June 6, 2005:

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

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 Department. **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 Department.**

The fact that the EHPA criteria may increase the cost of construction of a facility is not a factor that will be considered for an exemption by the Department. Cost of construction may be considered as a factor when selecting the facilities 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 determined to be "new construction," as defined in s. 1013.01(14), F.S. and s. 423.5.8, FBC; 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.

Between 1995 and 2000, there was a "three-mile exemption" for the EHPA criteria in Florida Statutes, whereby a board was only required to construct one facility to the criteria within any given three-mile radius. The exemption significantly impeded progress towards elimination of the safe public hurricane shelter space deficit through new school construction. Therefore, the Legislature eliminated the three-mile exemption in 2000.

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.

During initial development of the EHPA criteria, the concept of "core areas" was established to more cost effectively create usable hurricane shelter spaces during the design phase of a new educational facility (thus the term "Enhanced Hurricane Protection Area"). Under the EHPA concept, appropriate rooms and spaces that are required or useful for a hurricane shelter operation are concentrated into fewer more manageable areas, in some cases whole buildings, and in other cases portions of buildings. This permitted boards and their design professionals to reduce the amount of square footage required to meet the EHPA criteria, thus reducing construction costs, and at the same time providing emergency managers and shelter staff with a more manageable hurricane shelter environment.

When this concept was translated into statute and code language, the original language used the term "core facility area" instead of "core area." As with the three-mile exemption, interpretation of the statute and code to mean "core facility" could significantly impede progress towards elimination of the safe public hurricane shelter space deficit through new school construction. Therefore, to eliminate confusion and reinforce legislative intent, the Legislature eliminated the "core facility area" language from s. 1013.372, F.S. in 2001, and replaced it with "A facility, or an appropriate area within a facility" in Chapter 2002-387, Laws of Florida (pp 870 and 871).

For emergency management purposes, "core areas" are portions of a facility with defined boundaries, barriers or partitions that have been designated for use during an emergency. For hurricanes and other severe storms, occupant safety is the primary consideration, regardless of the normal educational purpose of the spaces. In addition to cafeterias and interior/inside circulation areas, appropriately designed and constructed gymnasiums, auditoriums and classrooms can be used as EHPA core areas. Also, media

centers and restrooms are normally excluded by emergency managers when calculating the hurricane shelter net usable floor area for occupant capacity purposes.

The EHPA requirement applies to School Infrastructure Thrift (SIT) award candidates. Section 1013.42(2), F.S. does not indicate that the EHPA requirement may be relaxed, and unless lawfully exempted, it is unlawful to construct a new educational facility without the EHPA criteria. The Department of Education has stated in memoranda DPBM No. 99-05 and DPBM No. 02-42 that boards may request cost waivers for statutory limitations on cost per student station, and deduct the additional cost directly associated with the EHPA from the total construction cost when applying for a SIT award.

1013.42 School Infrastructure Thrift (SIT) Program Act.--

(2) The School Infrastructure Thrift (SIT) Program is established within the Department of Education, and the State Board of Education may adopt rules as necessary to operate the program. To facilitate the program's purposes, the department shall aggressively seek the elimination or revision of obsolete, excessively restrictive, or unnecessary laws, rules, and regulations for the purpose of reducing the cost of constructing educational facilities and related costs without sacrificing safety or quality of construction. Such efforts must include, but are not limited to, the elimination of duplicate or overlapping inspections; the relaxation of requirements relating to the life cycle of buildings, landscaping, operable glazing, operable windows, radon testing, and firesafety when lawful, safe, and cost-beneficial; and other cost savings identified as lawful, safe, and cost-beneficial.

Both the Florida Statutes and the FBC 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 or high winds. 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 landfalling 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 (landfalling, 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, 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, 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.)

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 (sometimes in reportable quantities) 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 Department 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 Department 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, for all intents and purposes, interpreted to mean any factor that, despite the 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 Certain 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, FBC, are exempt from compliance with the EHPA criteria.

However, remodeling projects are required to be brought into compliance with applicable codes. In certain circumstances, this may mean substantial alteration or replacement of a facility's structural systems. Given the magnitude of the hurricane shelter space deficit, it may be appropriate to incorporate the EHPA criteria during this type of remodeling project. In consultation with the applicable local emergency management agency, evaluate the benefits of incorporating the EHPA criteria into the remodeling project. The decision to incorporate the EHPA criteria will be dependent upon the magnitude of the county and regional hurricane shelter space deficit, quantity of hurricane shelter spaces to be created, local shelter demand and the availability of suitable alternatives (either in-place, or within the framework of a five-year plan.) Also, it must be determined if a statutory or code exemption would apply to the construction project, other than that the project is a remodeling of an existing facility.

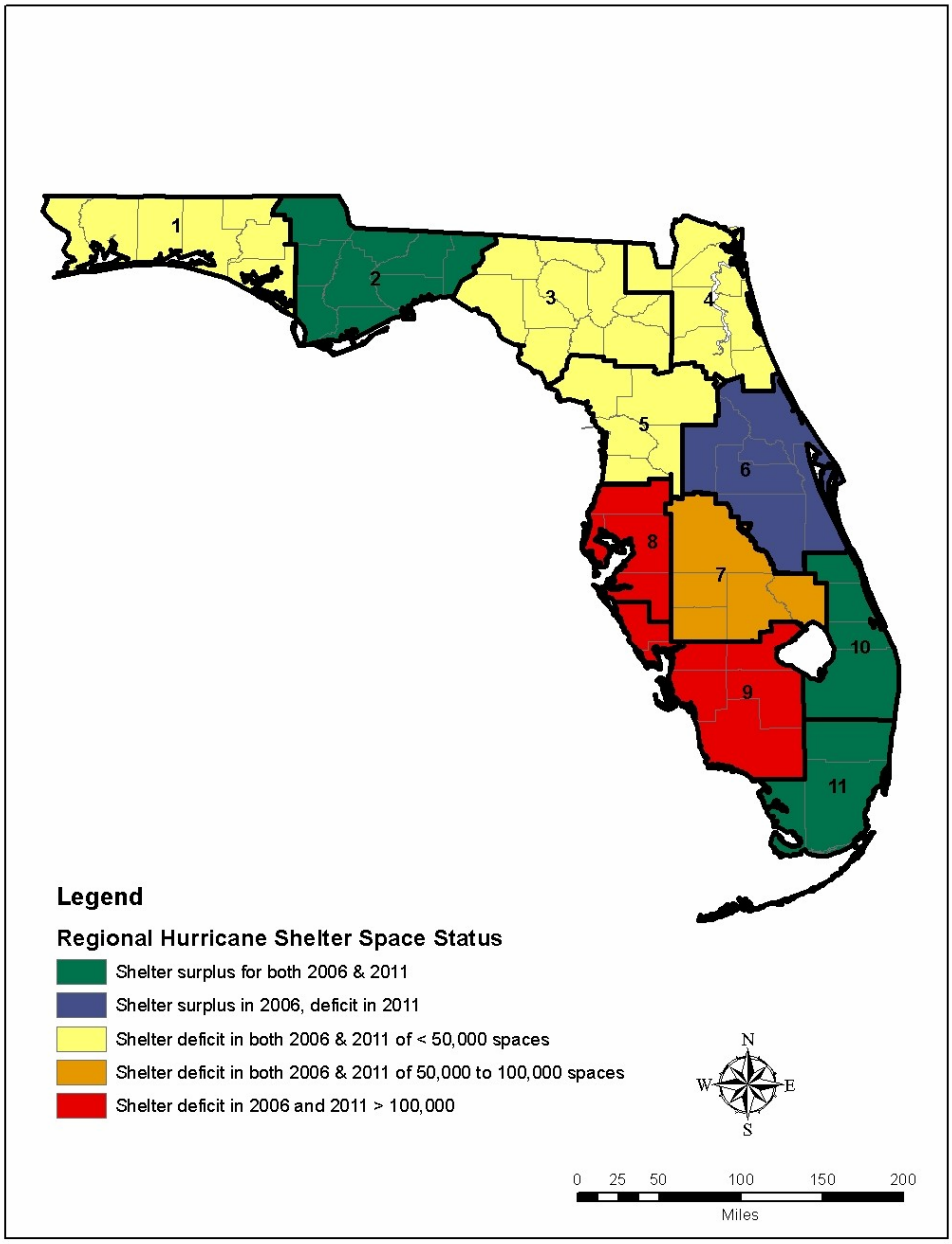
2.2.5 Regional Surplus of "Safe" Hurricane Shelter Space.

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, at this time only four (4) RPC regions have a surplus of hurricane shelter space in 2006: 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 2, 10 and 11 through 2011; RPC region 6 will experience a deficit in 2011, but only if there are no additional shelter capacity created. All other regions have hurricane shelter space deficits, and per section 1013.372(1), Florida Statutes, their 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 45 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.

Based upon s. 1013.372, F.S. and s. 423.25, FBC, the following procedures are recommended by the Department when requesting exemptions from the public shelter design criteria/EHPA requirement:

1. The board must notify the local emergency management agency of all new educational facility construction projects, and certain remodeling projects.

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 must 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 primary educational purpose and the secondary 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 Department. 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 Department 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 Department 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. Subsequently, Report No. 02-055 was published in 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 or otherwise) by local emergency management agencies or the Department.

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.state.fl.us/audgen/pages/pdf_files/02-055.pdf

The Auditor General recommended that the Department of Community Affairs, in consultation with the 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.

DPBM No. 02-42 can also be viewed at the following web address:

http://www.firn.edu/doe/cefo/archivedmemos/dpbm01_memo/dpbm0242.htm

Since distribution of the Auditor General's report and the Department of Education's memorandum in 2001, the Department's Division of Emergency Management has taken additional steps to encourage compliance with the EHPA criteria through the emergency management community. As examples, 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 statutory Statewide Emergency Shelter Plan, 2004 edition 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 2006 Plan, the Division again coordinated 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 2005. 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 Department has not granted an exemption, so any exemptions would have been local. The Division received about a 90 percent response rate from county emergency management offices. Table 2-1 provides a summary of the findings.

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

Description	Number of Bldgs	Net Square Feet
Total Number of New Buildings for Years 2000 to 2005	1708	50,718,368
Department Recognized EHPA Buildings	302	12,510,243
Local Emergency Management Exempted Buildings	269	7,327,606
New Buildings Located in Category 1, 2 or 3 Hurricane Evacuation Zones	296	8,691,039
Total Number of New Buildings that met Lawful Requirements	867	28,528,888
Total Number of New Buildings that did not meet Lawful Requirements	841	22,189,480
Percentage of New Buildings that Complied with the Law	51	56
Percentage of New Buildings that did not Comply with the Law	49	44
Potential EHPA Space Lost (50% required by Code)	---	11,094,740
Potential EHPA Net Square Feet Lost (average 65% usability factor)	---	7,211,581
Potential EHPA Spaces Lost (at Code required 20 square feet each)	---	360,579 spaces

The results are not encouraging. According to the FISH data, there were 1,708 new school buildings constructed between 2000 and 2005 with an estimated total net

usable floor area of 50,718,368 square feet. The Division recognizes 302 facilities (12,510,243 square feet) as EHPA's, and another 565 buildings (16,018,645 square feet) were lawfully exempt for statutory and code approved causes. Therefore, based on the data available, only about 867 of 1,708 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 22,189,480 square feet, or a non-compliance rate of about 44 percent. Based on this estimate, there was sufficient square footage in the non-compliant new buildings to have substantially reduced Florida's current statewide hurricane shelter space deficit. Clearly more needs to be accomplished to improve compliance with the EHPA statutory and code requirements.

3.0 REGIONAL HURRICANE EVACUATION SHELTER REQUIREMENTS

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 are located 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 are provided for Hurricane Category 5 in Table 3-1 for Shelter Capacity, Shelter Demands, Shelter Surpluses/Deficits, and Capacity Results for 2006 and 2011 in number of persons. Region/County estimates are provided for Hurricane Category 5 in Table 3-2 for Shelter Capacity, Shelter Demands, Shelter Surpluses/Deficits, and Capacity Results for 2006 and 2011 in square feet.

Shelter Demand Sources/Results by County. County shelter demand estimates are provided for Storm Categories 4 and 5, and include shelter demand for 2006/2011, vulnerable populations, percentages of vulnerable populations, and sources (Hurricane Evacuation Studies), in Appendix J.

The 2006 and 2011 populations are estimates, based on county growth during the previous decade (1990-2000) from the *Florida Population: Census Summary 2000* as prepared by the Bureau of Economic and Business Research (BEBR) at the University of Florida. The Category 5 vulnerable populations from the Regional Hurricane Evacuation Studies were multiplied by the average annual percentage growth rate per county to derive a base growth rate. This figure was then multiplied by the applicable number of years between the year that the Hurricane Evacuation Study data was collected and the year 2006. To estimate the vulnerable population for 2011, the 2006 vulnerable population figure was increased based on the growth rate published in the 2004 BEBR. Finally, this figure was added to the original Category 4 and 5 Vulnerable Populations from the Regional Hurricane Evacuation Studies to derive an estimate corrected for both population growth and the age of the data.

Determining County Shelter Capacities. County shelter capacity data for all 67 counties were updated by local emergency management agencies throughout 2005, and also cross-referenced with the *2005 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. To provide an estimate of the existing hurricane shelter square footage, the total of each county's current shelter capacities (those that meet ARC 4496 standards) was multiplied by the 20 square feet per person (based on EHPA requirement of 20 square feet per person) for general population shelters, and where appropriate, 60 square feet for Persons with Special Needs (PSN).

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.

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.

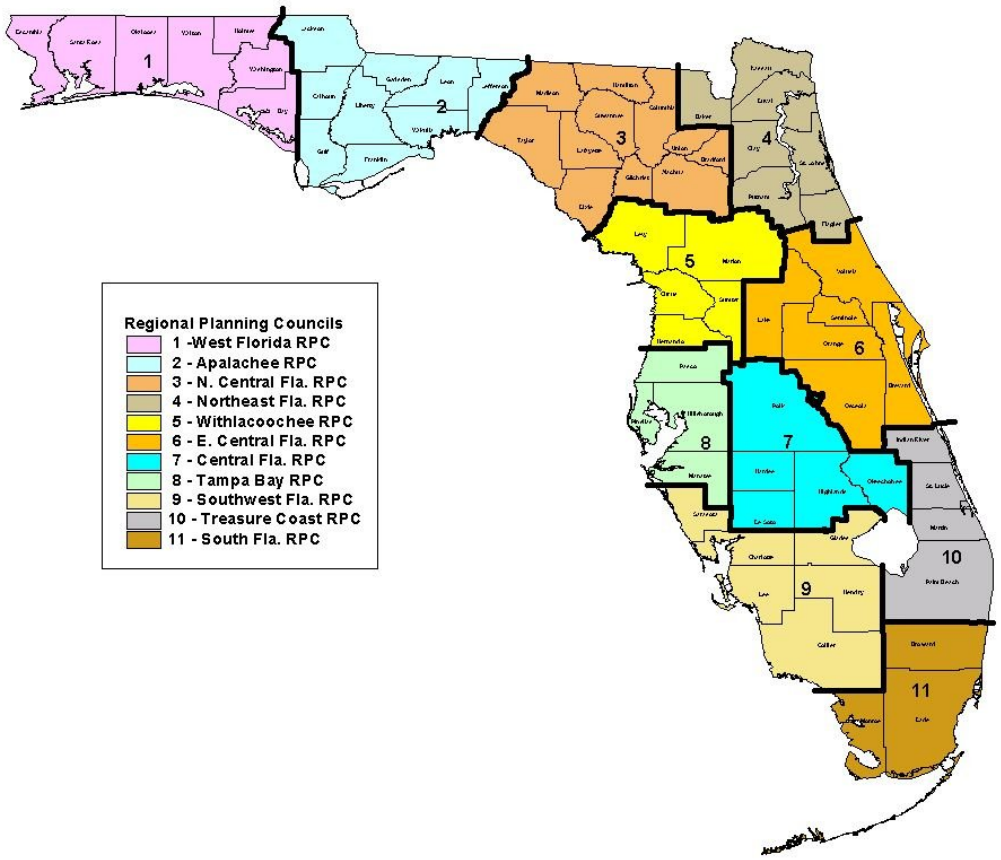
The hurricane evacuation studies conducted for all regions of Florida between 1988 and 2000 include shelter demand figures for each county. For this Plan, these data served as the basis for estimating the year 2006 and 2011 shelter demand numbers for Florida's coastal counties. The same methodology for projecting the vulnerable population to the year 2006 and 2011 was used to calculate the estimated shelter demand figures for those years.

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. The tables' columns provide the following information:

Region Number: This column sorts the listing of counties by Regional Planning Council (RPC) Regional Numbers. Figure 3-1 illustrates the RPC regions in Florida.

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



Shelter Demand in People and Square Footage: The General Shelter Population Demand figures for people and square footage are derived using the same methodology from the Category 5 Vulnerable Population. The Shelter Demand "In People" figure from the Regional Hurricane Evacuation Studies was multiplied by the sum of the average annual percentage growth times the applicable number of years between the year that the Hurricane Evacuation Study data was collected and the year 2006, and to estimate the 2011 vulnerable population, the 2006 vulnerable population was increased based on the applicable growth rate published in the 2004 BEBR. This figure was then added to the original Shelter Demand from the Regional Hurricane Evacuation Studies to derive an estimate corrected for both population growth and the age of the data.

The Shelter Demand in Square Footage was determined by multiplying the Shelter Demand In People by 20 square feet per person for each county. For Monroe County and the inland counties of the North Central and Withlacoochee RPC regions, the

most recent hurricane evacuation study did not provide a specific shelter demand figure. In those cases the shelter demand figures were determined by multiplying the applicable county's hurricane evacuation study derived vulnerable population figures by the public shelter use percentages developed in HMG's most recent behavioral survey for the county or region.

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 three factors considered were: (1) the maximum daily census of PSN clients in SpNSs in each county during the 2004 and 2005 hurricane seasons, (2) the local Emergency Management Agencies estimate of demand for PSN clients, or (3) thirty-five percent of the current PSN registry in each county. The third "factor" was derived from observations over the last two hurricane seasons that in the majority of counties (especially the lesser populated counties) approximately thirty-five percent of the total number of PSN registrants appeared to actually use SpNSs. In each case, the demand was determined by selecting the largest figure of the three factors.

Shelter Capacity: 2006 Risk Shelter Capacity figures for people and square footage were provided by each of the 67 county emergency management directors, and correlated with available information from county shelter surveys, and the construction of EHPAs at schools in each county. The figures were based on shelter capacity meeting/exceeding the ARC 4496 standards. Available general risk shelter capacity is based on 20 square feet of usable space per person. Available PSN risk shelter capacity is based on 60 square feet of usable space per person. Risk shelter capacity that is not yet verified through ARC 4496 surveys and/or EHPA construction is not included in this column, but is carried in each county shelter status in Appendix A under the column title: "Risk Capacity In People (Does not Meet ARC 4496 or Not Yet Surveyed)".

Shelter Surplus/Deficit In People and Square Footage: The 2006 Shelter Surplus/Deficit figures for In People and Square Footage is the difference between the Shelter Demand and the Shelter Capacity in both measurements. This data is provided as a quick reference to determine if the county is deficient in available Risk Capacity Shelter Space for both 2006 estimates and 2011 projections and is based on the Shelter Surplus/Deficit In People figure.

TABLE 3-1

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2006 Category 5 Shelter Demand In People (estimated)	2011 Category 5 Shelter Demand In People (estimated)	2006 Risk Shelter Capacity In People	2006 Shelter Surplus/ Deficit In People	2011 Shelter Surplus/ Deficit In People	2006 Category 5 Shelter Demand In Clients (estimated)	2011 Category 5 Shelter Demand In Clients (estimated)	2006 Risk Shelter Capacity In Clients	2006 Shelter Surplus/ Deficit In Clients	2011 Shelter Surplus/ Deficit In Clients
1	BAY	15,682	16,603	13,320.00	(2,362)	(3,283)	762	944	300.00	(462)	(644)
1	ESCAMBIA	17,125	17,877	12,988.00	(4,137)	(4,889)	525	610	497.00	(28)	(113)
1	HOLMES	1,441	1,493	2,018.00	577	525	20	23	38.00	18	15
1	OKALOOSA	14,067	15,226	2,145.00	(11,922)	(13,081)	353	443	893.00	540	450
1	SANTA ROSA	9,221	10,472	4,636.00	(4,585)	(5,836)	150	197	377.00	227	180
1	WALTON	4,684	5,515	4,839.00	155	(676)	50	68	92.00	42	24
1	WASHINGTON	1,423	1,566	2,830.00	1,407	1,264	212	257	0.00	(212)	(257)
Region 1 Subtotals:		63,643	68,752	42,776	(20,867)	(25,976)	2,072	2,542	2,197	125	(345)
2	CALHOUN	1,340	1,398	0.00	(1,340)	(1,398)	55	63	0.00	(55)	(63)
2	FRANKLIN	1,011	944	0.00	(1,011)	(944)	10	12	0.00	(10)	(12)
2	GADSDEN	2,966	3,047	2,535.00	(431)	(512)	79	93	0.00	(79)	(93)
2	GULF	617	603	103.00	(514)	(500)	289	345	0.00	(289)	(345)
2	JACKSON	3,740	3,838	3,034.00	(706)	(804)	249	297	33.00	(216)	(264)
2	JEFFERSON	1,035	1,069	809.00	(226)	(260)	18	21	0.00	(18)	(21)
2	LEON	9,227	9,906	22,413.00	13,186	12,507	85	106	458.00	373	352
2	LIBERTY	895	935	1,150.00	255	215	20	24	0.00	(20)	(24)
2	WAKULLA	1,093	1,277	400.00	(693)	(877)	30	43	0.00	(30)	(43)
Region 2 Subtotals:		21,924	23,017	30,444	8,520	7,427	835	1,004	491	(344)	(513)
3	ALACHUA	9,651	10,355	8,445.00	(1,206)	(1,910)	252	309	200.00	(52)	(109)
3	BRADFORD	2,081	2,179	1,533.00	(548)	(646)	44	51	65.00	21	14
3	COLUMBIA	5,899	6,507	2,297.00	(3,602)	(4,210)	44	55	0.00	(44)	(55)

TABLE 3-1

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2006 Category 5 Shelter Demand In People (estimated)	2011 Category 5 Shelter Demand In People (estimated)	2006 Risk Shelter Capacity In People	2006 Shelter Surplus/ Deficit In People	2011 Shelter Surplus/ Deficit In People	2006 Category 5 Shelter Demand In Clients (estimated)	2011 Category 5 Shelter Demand In Clients (estimated)	2006 Risk Shelter Capacity In Clients	2006 Shelter Surplus/ Deficit In Clients	2011 Shelter Surplus/ Deficit In Clients
3	DIXIE	2,782	3,030	2,051.00	(731)	(979)	90	112	84.00	(6)	(28)
3	GILCHRIST	2,173	2,448	3,243.00	1,070	795	35	47	102.00	67	55
3	HAMILTON	1,482	1,530	1,701.00	219	171	26	31	0.00	(26)	(31)
3	LAFAYETTE	932	980	328.00	(604)	(652)	5	6	0.00	(5)	(6)
3	MADISON	1,637	1,695	4,311.00	2,674	2,616	61	68	28.00	(33)	(40)
3	SUWANNEE	4,647	5,240	203.00	(4,444)	(5,037)	26	32	100.00	74	68
3	TAYLOR	2,322	2,453	2,424.00	102	(29)	11	13	0.00	(11)	(13)
3	UNION	1,233	1,306	1,251.00	18	(55)	35	45	45.00	10	0
Region 3 Subtotals:		34,839	37,723	27,787	(7,052)	(9,936)	629	769	624	(5)	(145)
4	BAKER	2,165	2,332	306.00	(1,859)	(2,026)	25	33	0.00	(25)	(33)
4	CLAY	10,726	12,174	4,562.00	(6,164)	(7,612)	158	217	98.00	(60)	(119)
4	DUVAL	33,171	35,537	19,130.00	(14,041)	(16,407)	496	604	998.00	502	394
4	FLAGLER	7,140	9,081	4,130.00	(3,010)	(4,951)	176	237	0.00	(176)	(237)
4	NASSAU	5,177	5,820	5,036.00	(141)	(784)	75	105	109.00	34	4
4	PUTNAM	9,539	9,914	1,071.00	(8,468)	(8,843)	95	105	0.00	(95)	(105)
4	ST.JOHNS	9,873	11,514	12,070.00	2,197	556	650	858	646.00	(4)	(212)
Region 4 Subtotals:		77,791	86,372	46,305	(31,486)	(40,067)	1,675	2,159	1,851	176	(308)
5	CITRUS	5,637	6,159	5,165.00	(472)	(994)	300	345	0.00	(300)	(345)
5	HERNANDO	16,227	17,925	4,457.00	(11,770)	(13,468)	289	329	391.00	102	62
5	LEVY	2,782	3,068	1,928.00	(854)	(1,140)	50	61	136.00	86	75
5	MARION	13,741	15,420	6,850.00	(6,891)	(8,570)	500	594	654.00	154	60
5	SUMTER	4,084	4,791	544.00	(3,540)	(4,247)	247	317	0.00	(247)	(317)

TABLE 3-1

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2006 Category 5 Shelter Demand In People (estimated)	2011 Category 5 Shelter Demand In People (estimated)	2006 Risk Shelter Capacity In People	2006 Shelter Surplus/ Deficit In People	2011 Shelter Surplus/ Deficit In People	2006 Category 5 Shelter Demand In Clients (estimated)	2011 Category 5 Shelter Demand In Clients (estimated)	2006 Risk Shelter Capacity In Clients	2006 Shelter Surplus/ Deficit In Clients	2011 Shelter Surplus/ Deficit In Clients
Region 5 Subtotals:		42,471	47,363	18,944	(23,527)	(28,419)	1,386	1,646	1,181	(205)	(465)
6	BREVARD	17,536	18,907	29,316.00	11,780	10,409	1,200	1,422	1,840.00	640	418
6	LAKE	17,024	19,683	17,484.00	460	(2,199)	360	447	429.00	69	(18)
6	ORANGE	14,034	15,801	7,359.00	(6,675)	(8,442)	679	822	904.00	225	82
6	OSCEOLA	10,478	12,609	14,231.00	3,753	1,622	320	429	1,040.00	720	611
6	SEMINOLE	3,361	3,687	11,829.00	8,468	8,142	125	157	226.00	101	69
6	VOLUSIA	30,669	33,312	21,145.00	(9,524)	(12,167)	601	687	1,034.00	433	347
Region 6 Subtotals:		93,102	103,999	101,364	8,262	(2,635)	3,285	3,964	5,473	2,188	1,509
7	DESOTO	6,629	7,412	2,465.00	(4,164)	(4,947)	120	139	191.00	71	52
7	HARDEE	10,124	10,684	557.00	(9,567)	(10,127)	65	71	75.00	10	4
7	HIGHLANDS	23,059	24,930	2,103.00	(20,956)	(22,827)	150	165	0.00	(150)	(165)
7	OKEECHOBEE	19,696	20,780	2,939.00	(16,757)	(17,841)	125	137	66.00	(59)	(71)
7	POLK	42,086	45,724	42,193.00	107	(3,531)	1,112	1,287	0.00	(1,112)	(1,287)
Region 7 Subtotals:		101,594	109,530	50,257	(51,337)	(59,273)	1,572	1,799	332	(1,240)	(1,467)
8	HILLSBOROUGH	121,213	133,166	82,954.00	(38,259)	(50,212)	914	1,107	1,233.00	319	126
8	MANATEE	32,998	36,549	35,271.00	2,273	(1,278)	430	484	1,099.00	669	615
8	PASCO	53,224	59,184	23,988.00	(29,236)	(35,196)	783	882	1,172.00	389	290
8	PINELLAS	122,444	126,287	38,084.00	(84,360)	(88,203)	700	746	2,233.00	1,533	1,487
Region 8 Subtotals:		329,879	355,186	180,297	(149,582)	(174,889)	2,827	3,219	5,737	2,910	2,518
9	CHARLOTTE	46,705	51,556	3,127.00	(43,578)	(48,429)	204	231	0.00	(204)	(231)
9	COLLIER	49,736	58,923	21,385.00	(28,351)	(37,538)	534	680	1,362.00	828	682
9	GLADES	3,320	3,534	1,081.00	(2,239)	(2,453)	10	11	0.00	(10)	(11)

TABLE 3-1

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2006 Category 5 Shelter Demand In People (estimated)	2011 Category 5 Shelter Demand In People (estimated)	2006 Risk Shelter Capacity In People	2006 Shelter Surplus/ Deficit In People	2011 Shelter Surplus/ Deficit In People	2006 Category 5 Shelter Demand In Clients (estimated)	2011 Category 5 Shelter Demand In Clients (estimated)	2006 Risk Shelter Capacity In Clients	2006 Shelter Surplus/ Deficit In Clients	2011 Shelter Surplus/ Deficit In Clients
9	HENDRY	4,734	5,211	6,149.00	1,415	938	20	23	54.00	34	31
9	LEE	108,769	124,368	34,188.00	(74,581)	(90,180)	388	470	0.00	(388)	(470)
9	SARASOTA	62,149	67,556	52,160.00	(9,989)	(15,396)	1,400	1,609	1,025.00	(375)	(584)
Region 9 Subtotals:		275,413	311,148	118,090	(157,323)	(193,058)	2,556	3,024	2,441	(115)	(583)
10	INDIAN RIVER	4,875	5,409	7,286.00	2,411	1,877	449	519	582.00	133	63
10	MARTIN	8,439	9,217	13,523.00	5,084	4,306	240	280	626.00	386	346
10	PALM BEACH	44,250	48,991	48,953.00	4,703	(38)	291	334	333.00	42	(1)
10	ST.LUCIE	6,436	7,246	15,035.00	8,599	7,789	593	710	666.00	73	(44)
Region 10 Subtotals:		64,000	70,863	84,797	20,797	13,934	1,573	1,843	2,207	634	364
11	BROWARD	31,199	33,989	37,135.00	5,936	3,146	265	297	2,665.00	2,400	2,368
11	MIAMI-DADE	58,129	61,922	86,511.00	28,382	24,589	500	565	1,332.00	832	767
11	MONROE	17,102	17,197	0.00	(17,102)	(17,197)	500	614	233.00	(267)	(381)
Region 11 Subtotals:		106,430	113,108	123,646	17,216	10,538	1,265	1,476	4,230	2,965	2,754
	Totals	1,211,086	1,327,061	824,707	(386,379)	(502,354)	19,675	23,445	26,764	7,089	3,319

TABLE 3-2

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2006 Category 5 Shelter Demand In SF (estimated)	2011 Category 5 Shelter Demand In SF (estimated)	2006 Risk Shelter Capacity In SF	2006 Shelter Surplus/ Deficit In SF	2011 Shelter Surplus/ Deficit In SF	2006 Category 5 Shelter Demand In SF(estimated)	2011 Category 5 Shelter Demand In SF (estimated)	2006 Risk Shelter Capacity In SF	2006 Shelter Surplus/ Deficit In SF	2011 Shelter Surplus/ Deficit In SF
1	BAY	313,640	332,060	244,837	(68,803)	(87,223)	45,720	56,640	7,434	(38,286)	(49,206)
1	ESCAMBIA	342,500	357,540	253,766	(88,734)	(103,774)	31,500	36,600	26,212	(5,288)	(10,388)
1	HOLMES	28,820	29,860	38,170	9,350	8,310	1,200	1,380	2,280	1,080	900
1	OKALOOSA	281,340	304,520	35,427	(245,913)	(269,093)	21,180	26,580	53,556	32,376	26,976
1	SANTA ROSA	184,420	209,440	84,499	(99,921)	(124,941)	9,000	11,820	22,620	13,620	10,800
1	WALTON	93,680	110,300	103,077	9,397	(7,223)	3,000	4,080	5,502	2,502	1,422
1	WASHINGTON	28,460	31,320	63,562	35,102	32,242	12,720	15,420	0	(12,720)	(15,420)
Region 1 Subtotals:		1,272,860	1,375,040	823,338	(449,522)	(551,702)	124,320	152,520	117,604	(6,716)	(34,916)
2	CALHOUN	26,800	27,960	0	(26,800)	(27,960)	3,300	3,780	0	(3,300)	(3,780)
2	FRANKLIN	20,220	18,880	0	(20,220)	(18,880)	600	720	0	(600)	(720)
2	GADSDEN	59,320	60,940	46,192	(13,128)	(14,748)	4,740	5,580	0	(4,740)	(5,580)
2	GULF	12,340	12,060	2,667	(9,673)	(9,393)	17,340	20,700	0	(17,340)	(20,700)
2	JACKSON	74,800	76,760	58,021	(16,779)	(18,739)	14,940	17,820	1,980	(12,960)	(15,840)
2	JEFFERSON	20,700	21,380	14,790	(5,910)	(6,590)	1,080	1,260	0	(1,080)	(1,260)
2	LEON	184,540	198,120	362,379	177,839	164,259	5,100	6,360	27,520	22,420	21,160
2	LIBERTY	17,900	18,700	21,121	3,221	2,421	1,200	1,440	0	(1,200)	(1,440)
2	WAKULLA	21,860	25,540	6,711	(15,149)	(18,829)	1,800	2,580	0	(1,800)	(2,580)
Region 2 Subtotals:		438,480	460,340	511,881	73,401	51,541	50,100	60,240	29,500	(20,600)	(30,740)
3	ALACHUA	193,020	207,100	207,274	14,254	174	15,120	18,540	12,000	(3,120)	(6,540)
3	BRADFORD	41,620	43,580	24,289	(17,331)	(19,291)	2,640	3,060	4,888	2,248	1,828
3	COLUMBIA	117,980	130,140	44,185	(73,795)	(85,955)	2,640	3,300	0	(2,640)	(3,300)
3	DIXIE	55,640	60,600	44,204	(11,436)	(16,396)	5,400	6,720	5,019	(381)	(1,701)

TABLE 3-2

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2006 Category 5 Shelter Demand In SF (estimated)	2011 Category 5 Shelter Demand In SF (estimated)	2006 Risk Shelter Capacity In SF	2006 Shelter Surplus/ Deficit In SF	2011 Shelter Surplus/ Deficit In SF	2006 Category 5 Shelter Demand In SF(estimated)	2011 Category 5 Shelter Demand In SF (estimated)	2006 Risk Shelter Capacity In SF	2006 Shelter Surplus/ Deficit In SF	2011 Shelter Surplus/ Deficit In SF
3	GILCHRIST	43,460	48,960	65,218	21,758	16,258	2,100	2,820	6,115	4,015	3,295
3	HAMILTON	29,640	30,600	33,120	3,480	2,520	1,560	1,860	0	(1,560)	(1,860)
3	LAFAYETTE	18,640	19,600	7,176	(11,464)	(12,424)	300	360	0	(300)	(360)
3	MADISON	32,740	33,900	64,806	32,066	30,906	3,660	4,080	1,680	(1,980)	(2,400)
3	SUWANNEE	92,940	104,800	4,067	(88,873)	(100,733)	1,560	1,920	6,000	4,440	4,080
3	TAYLOR	46,440	49,060	37,994	(8,446)	(11,066)	660	780	0	(660)	(780)
3	UNION	24,660	26,120	29,705	5,045	3,585	2,100	2,700	2,010	(90)	(690)
Region 3 Subtotals:		696,780	754,460	562,038	(134,742)	(192,422)	37,740	46,140	37,712	(28)	(8,428)
4	BAKER	43,300	46,640	6,120	(37,180)	(40,520)	1,500	1,980	0	(1,500)	(1,980)
4	CLAY	214,520	243,480	93,626	(120,894)	(149,854)	9,480	13,020	3,130	(6,350)	(9,890)
4	DUVAL	663,420	710,740	478,250	(185,170)	(232,490)	29,760	36,240	70,022	40,262	33,782
4	FLAGLER	142,800	181,620	75,863	(66,937)	(105,757)	10,560	14,220	0	(10,560)	(14,220)
4	NASSAU	103,540	116,400	92,959	(10,581)	(23,441)	4,500	6,300	5,618	1,118	(682)
4	PUTNAM	190,780	198,280	21,387	(169,393)	(176,893)	5,700	6,300	0	(5,700)	(6,300)
4	ST.JOHNS	197,460	230,280	251,872	54,412	21,592	39,000	51,480	38,760	(240)	(12,720)
Region 4 Subtotals:		1,555,820	1,727,440	1,020,077	(535,743)	(707,363)	100,500	129,540	117,530	17,030	(12,010)
5	CITRUS	112,740	123,180	91,394	(21,346)	(31,786)	18,000	20,700	0	(18,000)	(20,700)
5	HERNANDO	324,540	358,500	86,239	(238,301)	(272,261)	17,340	19,740	23,500	6,160	3,760
5	LEVY	55,640	61,360	26,242	(29,398)	(35,118)	3,000	3,660	8,209	5,209	4,549
5	MARION	274,820	308,400	205,073	(69,747)	(103,327)	30,000	35,640	39,233	9,233	3,593
5	SUMTER	81,680	95,820	9,549	(72,131)	(86,271)	14,820	19,020	0	(14,820)	(19,020)
Region 5 Subtotals:		849,420	947,260	418,497	(430,923)	(528,763)	83,160	98,760	70,942	(12,218)	(27,818)

TABLE 3-2

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2006 Category 5 Shelter Demand In SF (estimated)	2011 Category 5 Shelter Demand In SF (estimated)	2006 Risk Shelter Capacity In SF	2006 Shelter Surplus/ Deficit In SF	2011 Shelter Surplus/ Deficit In SF	2006 Category 5 Shelter Demand In SF(estimated)	2011 Category 5 Shelter Demand In SF (estimated)	2006 Risk Shelter Capacity In SF	2006 Shelter Surplus/ Deficit In SF	2011 Shelter Surplus/ Deficit In SF
6	BREVARD	350,720	678,671	586,320	235,600	(92,351)	72,000	85,320	110,400	38,400	25,080
6	LAKE	340,480	393,660	352,195	11,715	(41,465)	21,600	26,820	21,101	(499)	(5,719)
6	ORANGE	280,680	316,020	267,393	(13,287)	(48,627)	40,740	49,320	66,216	25,476	16,896
6	OSCEOLA	209,560	252,180	310,301	100,741	58,121	19,200	25,740	84,960	65,760	59,220
6	SEMINOLE	67,220	73,740	208,014	140,794	134,274	7,500	9,420	16,958	9,458	7,538
6	VOLUSIA	613,380	666,240	453,663	(159,717)	(212,577)	36,060	41,220	52,824	16,764	11,604
Region 6 Subtotals:		1,862,040	2,380,511	2,177,886	315,846	(202,625)	197,100	237,840	352,459	155,359	114,619
7	DESOTO	132,580	148,240	47,102	(85,478)	(101,138)	7,200	8,340	11,460	4,260	3,120
7	HARDEE	202,480	213,680	7,784	(194,696)	(205,896)	3,900	4,260	4,500	600	240
7	HIGHLANDS	461,180	498,600	58,062	(403,118)	(440,538)	9,000	9,900	0	(9,000)	(9,900)
7	OKEECHOBEE	393,920	415,600	63,577	(330,343)	(352,023)	7,500	8,220	3,960	(3,540)	(4,260)
7	POLK	841,720	914,480	822,302	(19,418)	(92,178)	66,720	77,220	0	(66,720)	(77,220)
Region 7 Subtotals:		2,031,880	2,190,600	998,827	(1,033,053)	(1,191,773)	94,320	107,940	19,920	(74,400)	(88,020)
8	HILLSBOROUGH	2,424,260	2,663,320	1,651,331	(772,929)	(1,011,989)	54,840	66,420	73,980	19,140	7,560
8	MANATEE	659,960	730,980	722,502	62,542	(8,478)	25,800	29,040	65,898	40,098	36,858
8	PASCO	1,064,480	1,183,680	472,348	(592,132)	(711,332)	46,980	52,920	70,320	23,340	17,400
8	PINELLAS	2,448,880	2,525,740	814,990	(1,633,890)	(1,710,750)	42,000	44,760	133,980	91,980	89,220
Region 8 Subtotals:		6,597,580	7,103,720	3,661,171	(2,936,409)	(3,442,549)	169,620	193,140	344,178	174,558	151,038
9	CHARLOTTE	934,100	1,031,120	58,998	(875,102)	(972,122)	12,240	13,860	0	(12,240)	(13,860)
9	COLLIER	994,720	1,178,460	403,585	(591,135)	(774,875)	32,040	40,800	80,065	48,025	39,265
9	GLADES	66,400	70,680	21,762	(44,638)	(48,918)	600	660	0	(600)	(660)
9	HENDRY	94,680	104,220	114,816	20,136	10,596	1,200	1,380	3,244	2,044	1,864

TABLE 3-2

RPC Region #	County	General Population Shelter Demand/ Capacity					Special Needs Shelter Demand/ Capacity				
		2006 Category 5 Shelter Demand In SF (estimated)	2011 Category 5 Shelter Demand In SF (estimated)	2006 Risk Shelter Capacity In SF	2006 Shelter Surplus/ Deficit In SF	2011 Shelter Surplus/ Deficit In SF	2006 Category 5 Shelter Demand In SF(estimated)	2011 Category 5 Shelter Demand In SF (estimated)	2006 Risk Shelter Capacity In SF	2006 Shelter Surplus/ Deficit In SF	2011 Shelter Surplus/ Deficit In SF
9	LEE	2,175,380	2,487,360	710,336	(1,465,044)	(1,777,024)	23,280	28,200	0	(23,280)	(28,200)
9	SARASOTA	1,242,980	1,351,120	951,494	(291,486)	(399,626)	84,000	96,540	61,500	(22,500)	(35,040)
Region 9 Subtotals:		5,508,260	6,222,960	2,260,991	(3,247,269)	(3,961,969)	153,360	181,440	144,809	(8,551)	(36,631)
10	INDIAN RIVER	97,500	108,180	246,985	149,485	138,805	26,940	31,140	34,920	7,980	3,780
10	MARTIN	168,780	184,340	304,774	135,994	120,434	14,400	16,800	37,537	23,137	20,737
10	PALM BEACH	885,000	979,820	1,222,405	337,405	242,585	17,460	20,040	19,980	2,520	(60)
10	ST.LUCIE	128,720	144,920	354,338	225,618	209,418	35,580	42,600	41,161	5,581	(1,439)
Region 10 Subtotals:		1,280,000	1,417,260	2,128,502	848,502	711,242	94,380	110,580	133,598	39,218	23,018
11	BROWARD	623,980	679,780	1,330,956	706,976	651,176	15,900	17,820	133,349	117,449	115,529
11	MIAMI-DADE	1,162,580	1,238,440	1,727,413	564,833	488,973	30,000	33,900	79,920	49,920	46,020
11	MONROE	342,040	343,940	0	(342,040)	(343,940)	30,000	36,840	13,980	(16,020)	(22,860)
Region 11 Subtotals:		2,128,600	2,262,160	3,058,369	929,769	796,209	75,900	88,560	227,249	151,349	138,689
	Totals	24,221,720	26,841,751	17,621,577	(6,600,143)	(9,220,174)	1,180,500	1,406,700	1,595,501	415,001	188,801

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. 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 Department.

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 and a quarter (1¼) percent of current public shelter capacity. Community colleges are regionally distributed, and potentially located in areas with high demands for public hurricane shelter space. Also 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, per s. 1002.33(18), F.S., charter schools are required 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). It is the opinion of the Department, in consultation with the Department of Education, that new charter school facilities that either select or are subject to section 423, FBC, are subject 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. Given the public investment in the facilities, and the magnitude of the hurricane shelter space deficit, certain charter schools should be required to comply with the EHPA criteria.

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 s. 1013.01(14), F.S. or s. 423.5.8, FBC; 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 (e.g., 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 Department. 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 one and a half (1½) 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 agencies. Therefore, s. 1013.372(2), F.S. requires that the Department recommend an appropriate and available source of funding for the additional cost of constructing emergency shelters. There is no dedicated state source of funding to support construction of EHPA's, so the Department 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. Therefore, the Department recommends PECO funds, which 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 2005/06. 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 nine (9) years that the EHPA has been a code requirement. The average PECO funds distributed per EHPA space created is about $4,598; school boards with comparison values near or below this average were more productive than those that were significantly higher than the average or zero (0).

Table 5-1. Estimate of PECO Funds Distributed to School Districts 1997 – 2006 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	$9,690,027	250	$38,760
Baker	$1,448,893	306	$4,735
Bay	$9,034,582	900*	$10,038
Bradford	$1,457,861	0	$0
Brevard	$29,050,741	9,602*	$3,025
Broward	$163,261,497	45,130*	$3,618
Calhoun	$767,869	0	$0
Charlotte	$9,350,046	0	$0
Citrus	$6,005,604	415	$14,471

Table 5-1. Estimate of PECO Funds Distributed to School Districts 1997 – 2006 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, $
Clay	$17,819,886	1,834	$9,716
Collier	$30,498,161	12,919*	$2,361
Columbia	$3,496,212	2,297	$1,522
DeSoto	$1,611,542	0	$0
Dixie	$780,211	252*	$3,096
Duval	$39,997,770	5,654*	$7,074
Escambia	$13,399,452	1,349	$9,933
Flagler	$7,091,880	650	$10,911
Franklin	$405,961	0	$0
Gadsden	$1,951,392	2,535	$770
Gilchrist	$1,161,774	0	$0
Glades	$629,208	594	$1,059
Gulf	$935,677	103	$9,084
Hamilton	$556,748	1,200	$464
Hardee	$1,776,872	557	$3,190
Hendry	$3,000,638	1,000	$3,001
Hernando	$11,397,771	2,779	$4,101
Highlands	$4,500,322	967	$4,654
Hillsborough	$104,365,159	45,147	$2,312
Holmes	$1,034,954	1,953*	$530
Indian River	$7,299,163	0	$0
Jackson	$2,410,692	2,237*	$1,078
Jefferson	$493,585	809	$610
Lafayette	$376,901	0	$0
Lake	$22,531,565	17,005*	$1,325
Lee	$37,586,319	9,659	$3,891
Leon	$9,844,345	0	$0
Levy	$2,431,298	0	$0
Liberty	$429,633	548	$784
Madison	$992,571	0	$0
Manatee	$22,463,276	25,307*	$888
Marion	$23,729,139	2,629*	$9,026
Martin	$9,298,575	4,900	$1,898
Miami-Dade	$146,192,150	14,553	$10,045
Monroe	$2,571,913	0	$0
Nassau	$4,691,632	5,129	$915
Okaloosa	$8,096,029	0	$0
Okeechobee	$2,657,283	1,011	$2,628
Orange	$106,236,979	7,142*	$14,875
Osceola	$33,802,545	5,076*	$6,659

Table 5-1. Estimate of PECO Funds Distributed to School Districts 1997 – 2006 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, $
Palm Beach	$101,864,036	44,366	$2,296
Pasco	$37,506,270	8,354*	$4,490
Pinellas	$50,448,591	17,133*	$2,945
Polk	$36,883,342	40,238	$917
Putnam	$4,006,792	811	$4,941
St. Johns	$18,735,810	8,241*	$2,273
St. Lucie	$18,125,598	3,890	$4,660
Santa Rosa	$12,945,154	352	$36,776
Sarasota	$25,293,668	31,031*	$815
Seminole	$32,147,894	0	$0
Sumter	$2,039,377	200	$10,197
Suwannee	$1,785,388	203*	$8,795
Taylor	$1,292,312	2,424	$533
Union	$743,276	447*	$1,663
Volusia	$26,346,092	7,965*	$3,308
Wakulla	$2,543,481	400	$6,359
Walton	$2,929,272	1,258	$2,329
Washington	$1,793,718	153	$11,724
Statewide Total	**$1,298,044,374**	**402,864**	**$4,598**

* - 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: $4,598 is an average of the ratios.

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. As an example, some mitigation programs may share the cost of increasing the design wind speed by the EHPA criteria's recommended 40 miles per hour. The principal federal/state mitigation program is the Hazard Mitigation Grant Program (HMGP). However, the HMGP is not considered normally "available" for most new construction projects, since its grant cycles are often associated with 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.

5.4 Global Match Considerations

Global match is the pooling of multi-agency investments and resources to achieve a common goal. By agreement with the Federal Emergency Management Agency, Florida can pool state and local expenditures for improved hurricane-resistance of facilities to use as non-federal cost-share for HMGP projects.

Documented construction cost premiums of EHPA projects, that exceed minimum hurricane-resistance code requirements, can be used by the board and state and local emergency management agencies as non-federal cost-share (or match) for HMGP funded projects. As an example, the documented construction cost premium to increase the design wind speed of a new school facility by the code recommended 40 miles per hour is $300,000. Assuming the new school facility project meets other HMGP programmatic requirements (e.g., eligibility, benefit-cost, etc.), the $300,000 can be used as the state and local match to support other hurricane-resistance retrofit projects; such as, installing window protection on another facility that can be used as a public hurricane shelter.

Since 1999, global match has been used to create an estimated 179,200 public hurricane shelter spaces through retrofitting. The Department requests that boards document the construction cost premium of EHPA construction projects, and forward the information to the local emergency management agency and the Division. The documentation must specifically separate hurricane-resistance mitigation construction costs from other non-mitigation costs. As an example, the cost premium due to installation of heavier roof joists at a closer spacing is eligible, but installing additional toilets is not eligible.

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

The Division has statutory responsibility and authority to administer a statewide program to eliminate the deficit of "safe" hurricane shelter space. 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 facilities to increase shelter capacity; 3) construction of new facilities to meet the EHPA 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 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, legislation in 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, and it is 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.

The 1999 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 Department 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. The 2000 Legislature followed-up with 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 Hurricanes Floyd and Irene federal HMGP declaration, which were earmarked to support the state's effort to reduce the deficit of hurricane shelter space. Since 2000, subsequent Legislatures have appropriated more than $16 million in additional state funds to support projects recommended in subsequent *Shelter Retrofit Reports*. These appropriations have created about an additional 92,867 hurricane shelter spaces.

The *2005 Shelter Retrofit Report* can provide additional information concerning Florida's hurricane shelter survey and retrofit program. The *2005 Shelter Retrofit Report* can be viewed at the following web address:

http://floridadisaster.org/documents/SRR05.pdf

Since 1995, through federal, state, and local retrofitting of suitable facilities, Florida has created a total of 435,433 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 fifty-one (51) 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., conveniently 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 about 376,699 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 forty-four (44) 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.

Cumulatively, since 1995, the Division's hurricane shelter survey and retrofit program has directly or indirectly led to identification or creation of about 474,772 hurricane shelter spaces that meet ARC 4496 guidelines. The EHPA construction program has created about 376,699 hurricane shelter spaces. Therefore, by the 2006 hurricane season, Florida will have a total of about 851,471 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**	**250**	**8,195**	8,445
BAKER	0	306	0	306
BAY	0	0	13,320	13,320
BRADFORD	0	0	1,533	1,533
BREVARD	1,103	6,779	21,434	29,316
BROWARD	0	37,135	0	37,135
CALHOUN	0	0	0	0
CHARLOTTE	0	0	3,127	3,127
CITRUS	252	415	4,498	5,165
CLAY	0	1,834	2,728	4,562
COLLIER	0	10,708	10,677	21,385
COLUMBIA	0	2,297	0	2,297
DESOTO	0	0	2,465	2,465
DIXIE	0	0	2,051	2,051
DUVAL	0	5,309	13,821	19,130
ESCAMBIA	254	1,349	11,385	12,988
FLAGLER	1,677	650	1,803	4,130
FRANKLIN	0	0	0	0
GADSDEN	0	2,535	0	2,535
GILCHRIST	0	0	3,243	3,243
GLADES	0	594	487	1,081
GULF	0	103	0	103
HAMILTON	0	1,200	501	1,701
HARDEE	0	557	0	557
HENDRY	939	1,000	4,210	6,149
HERNANDO	0	2,779	1,678	4,457
HIGHLANDS	1,136	967	0	2,103
HILLSBOROUGH	1,766	45,147	36,041	82,954
HOLMES	0	1,839	179	2,018
INDIAN RIVER	75	0	7,211	7,286
JACKSON	0	2,138	896	3,034
JEFFERSON	0	809	0	809

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
LAFAYETTE	0	0	328	328
LAKE	0	15,718	1,766	17,484
LEE	9,933	9,659	14,596	34,188
LEON	822	517	21,074	22,413
LEVY	241	0	1,687	1,928
LIBERTY	0	548	602	1,150
MADISON	0	0	4,311	4,311
MANATEE	0	17,405	17,866	35,271
MARION	0	1,885	4,965	6,850
MARTIN	3,821	4,900	4,802	13,523
MIAMI-DADE	0	14,553	71,958	86,511
MONROE	0	0	0	0
NASSAU	0	4,802	234	5,036
OKALOOSA	166	0	1,979	2,145
OKEECHOBEE	0	1,011	1,928	2,939
ORANGE	1,802	5,228	329	7,359
OSCEOLA	0	2,454	11,777	14,231
PALM BEACH	0	44,366	4,587	48,953
PASCO	0	6,854	17,134	23,988
PINELLAS	8,638	14,133	15,313	38,084
POLK	1,007	40,238	948	42,193
PUTNAM	0	811	260	1,071
SANTA ROSA	597	352	3,687	4,636
SARASOTA	0	29,531	22,629	52,160
SEMINOLE	0	1,000	10,829	11,829
ST.JOHNS	0	6,741	5,329	12,070
ST.LUCIE	3,584	2,888	8,563	15,035
SUMTER	0	200	344	544
SUWANNEE	0	203	0	203
TAYLOR	0	2,424	0	2,424
UNION	0	312	939	1,251
VOLUSIA	268	5,775	15,102	21,145
WAKULLA	0	400	0	400
WALTON	1,258	1,258	2,323	4,839
WASHINGTON	0	153	2,677	2,830
Totals- General Pop	**39,339**	**363,019**	**422,349**	**824,707**
Totals SpNS	**0**	**13,680**	**13,084**	**26,764**
Grand Total	**39,339**	**376,699**	**435,433**	**851,471**

Florida is also reducing its hurricane shelter deficit by implementing new technologies, such as Light Detection And Ranging (LIDAR), and improved SLOSH computer models. These new technologies have been able to more precisely determine which areas are vulnerable to hurricane storm surge. As a result of these improved techniques, new hurricane evacuation studies have been performed, which in many cases either removed certain areas from storm surge zones, or minimized the surge height predicted.

Armed with new storm tide atlases and hurricane evacuation studies, local emergency management officials are able to refine their designated evacuation zones for each storm scenario. Smaller evacuation areas represent less people at risk. Fewer people at risk means fewer evacuees. Fewer evacuees translates into reduced shelter demand. Two examples of this application are Broward and Miami-Dade counties. Through a LIDAR project, Broward County was able to reduce its number of hurricane evacuees by about 250,000 residents, which reduced shelter demand by an estimated 37,500 spaces. Miami-Dade County was also able to reduce its evacuation zones through more precise ground survey methods. Its new evacuation zones reduce the number of those who must evacuate by approximately 395,000, which reduced shelter demand by an estimated 59,250 spaces.

Hurricane shelter demand has also been reduced through adjustments to reflect more current and accurate census information (i.e., 2000 census vs. 1990 census), and changes in the methodology of Hurricane Evacuation Studies. Historically, 25 percent or more of a hurricane vulnerable 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 can provide an example of relatively low public shelter use. Though none of the storms made landfall as a Category 5, two storms approached Florida at near Category 5 strength before making landfall as a Category 3 and 4; Hurricane Ivan and Hurricane Charley respectively. For Hurricane Ivan, an estimated 544,900 persons were under evacuation orders and only 33,472 evacuees were housed in public shelters (6 percent). For Hurricane Charley, which rapidly intensified a 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).

Since publication of the *2000 Statewide Emergency Shelter Plan*, the statewide average demand has fallen from about 24 percent to about 15 percent with publication of this Plan. The practical effect is an apparent reduction in hurricane shelter space demand since 2000, though 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.

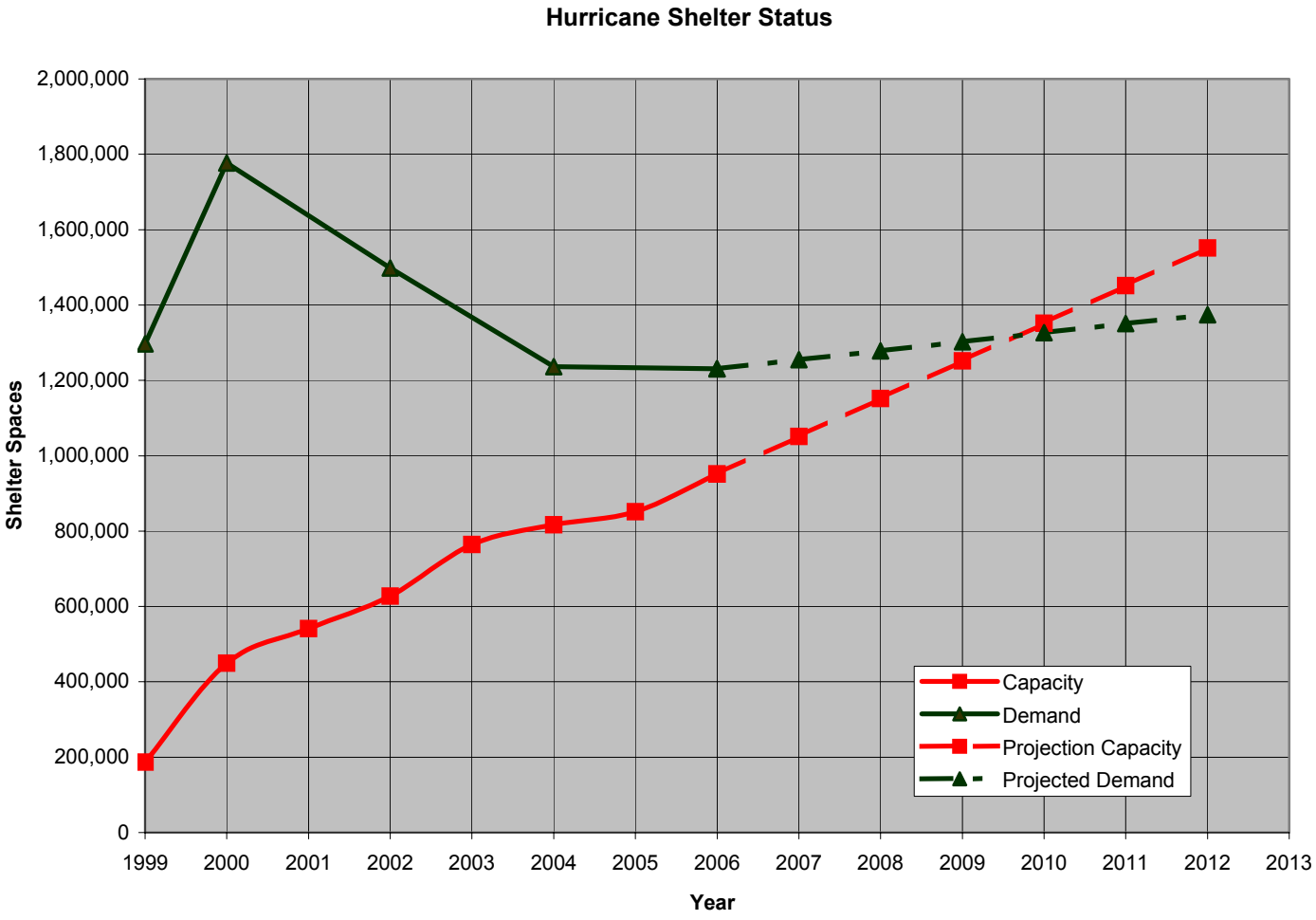
The Department has also developed a public information program to compliment the other hurricane shelter deficit reduction efforts. The Department educates residents on the hazards they face and how to best deal with them. A key issue is whether or not to evacuate and, if so, to where. Education on the 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.

Significant progress has been made toward eliminating Florida's deficit of public hurricane shelter space. Since publication of the *2000 Statewide Emergency Shelter Plan*, Florida now has 23 counties with demonstrable surpluses of hurricane shelter space. The counties with surpluses include Brevard, Broward, Gilchrist, Hamilton, Hendry, Holmes, Indian River, Lake, Leon, Liberty, Madison, Manatee, Martin, Miami-Dade, Palm Beach, Osceola, St. Johns, St. Lucie, Seminole, Taylor, Union, Walton, and Washington. Also, four regions have a demonstrable surplus of hurricane shelter space. Since 1995, Florida has reduced its hurricane shelter space deficit by about 74 percent.

As can be seen in Figure 6-1, the Department can now make a realistic estimate as to when the hurricane shelter space deficit may be eliminated. Based upon a cursory analysis of FISH inventory data, the Department found that about 42 million square feet of potentially suitable shelter space was constructed between 2000 and 2005. This quantity of square footage could potentially create as many as 683,000 new hurricane shelter spaces. Assuming that this is an average rate of construction, new construction could create about 113,000 EHPA spaces per year. Section 215.559(2)(b), F.S., directs an annual appropriation of $3 million to the Department for shelter retrofit projects. This level of funding is estimated to create an average of about 25,000 retrofitted hurricane shelter spaces per year. The following graph assumes a 25,000-space increase per year via $3 million in state retrofit funds, and a 75,000-space increase per year via other sources (primarily EHPA's). Together, this will create a combined 100,000 hurricane shelter spaces per year that meet ARC 4496. The Department estimates that by 2010, the state's deficit of hurricane shelter spaces may be eliminated.

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. Subsequently, 1013.372(2), Florida Statutes, requires that the Department of Community Affairs submit to the Governor and Cabinet for approval, every two years, the *Statewide Emergency Shelter Plan.* The Plan provides a listing of "safe" public shelter spaces (and square footage) versus estimated shelter demand for each county, Regional Planning Council region, and the state overall.

The 2006 Plan shows significant progress in reducing the deficit of "safe" public hurricane shelter space in Florida. Since 1995, more than 851,471 hurricane shelter spaces have been identified, created through retrofitting of existing buildings, or through new construction (e.g., EHPAs). In the 2000 Plan, the estimated shelter demand was 1,776,606 spaces. Through more accurate mapping of coastlines in certain counties (i.e., LIDAR mapping) and other improved topographic survey techniques, which reduced evacuation zones, and through improved shelter demand studies, the estimated public hurricane shelter demand has been reduced to 1,230,761 spaces for 2006. This is so, despite an increasing state population. Thus the overall state public hurricane shelter deficit has been reduced from 1,501,931 spaces in 2000, to 386,379 general population spaces in 2006 and a small surplus of special needs shelter spaces. This is nearly a 75 percent reduction in the statewide hurricane shelter space deficit.

Since publication of the *2000 Statewide Emergency Shelter Plan*, Florida now has 23 counties with demonstrable surpluses of hurricane shelter space. The counties with surpluses include Brevard, Broward, Gilchrist, Hamilton, Hendry, Holmes, Indian River, Lake, Leon, Liberty, Madison, Manatee, Martin, Miami-Dade, Palm Beach, Osceola, St. Johns, St. Lucie, Seminole, Taylor, Union, Walton, and Washington. Also, four regions have a demonstrable surplus of hurricane shelter space.

For the future, preliminary estimates indicate that, if the current rate of shelter space production is maintained, that the public hurricane shelter deficit will be eliminated by 2010. However, the state population is increasing yearly, and over time, current designated hurricane shelter buildings will 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