



State of Florida 2020 Shelter Retrofit Report

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Executive Summary

The Florida Division of Emergency Management (Division), as directed by section 252.385, Florida Statutes, annually publishes a *Shelter Retrofit Report*. The report provides a list of facilities recommended for retrofit using State funds for use as public hurricane evacuation shelters.

Retrofitting is defined as the modification of an existing structure to make it more resilient. For example, installing hurricane shutters on an existing building protects doors and windows from wind-borne debris. Such measures bring buildings up to at least minimum hurricane safety criteria and increase the availability of public hurricane evacuation shelter spaces.

Significant success has been made toward reducing the deficit of safe public hurricane evacuation space. “Safe” is defined as meeting the intent of American Red Cross (ARC) *Hurricane Evacuation Shelter Selection Standards* (June 2018), formerly the ARC *Standards for Hurricane Evacuation Shelter Selection* (January 2002). The combination of existing building surveys, retrofit projects and the availability of retrofit and mitigation-related funds for the recommended projects, as well as application of enhanced hurricane resistance design and construction standards has increased available hurricane evacuation shelter spaces to a total of 1,060,767. Another 59,407 spaces are expected to be available through retrofitting of recommended facilities by August 2021 for a total of 1,120,174 spaces.

The *2020 Shelter Retrofit Report* provides a prioritized list of specific retrofit projects and cost estimates submitted by county emergency management agencies and their partners. The report recommends 287 projects at an estimated cost of \$27,068,133. Initial data submitted by the counties indicates that 114,226 new hurricane evacuation shelter spaces could be added to the State’s shelter inventory. If all recommended projects were completed and added to the current expected August 2021 total of 1,120,174 spaces, the statewide cumulative total spaces could increase to 1,234,400 spaces.

Prior to 1999, the State lacked a dedicated funding source to meet the demands for public hurricane evacuation space. The only available federal funding source prior to 2001 was the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP). However, after 2001 the HMGP funding source began to require existing facilities to be retrofitted to standards found in FEMA 361, Community Shelter Guidance, or later the International Code Council (ICC) Standard 500 (ICC 500) storm shelter standard. For existing facilities, FEMA 361 and ICC 500 require extensive structural renovations. The use of these programs is dependent on the showing that such activities are cost effective. The extensive structural renovations required are usually not found to be cost effective, thus making federal grant funding for retrofitting unavailable. As the Division’s survey program identified potential evacuation spaces, the need for a reliable source of funding became evident.

Since 1999, the Governor and the Legislature have committed to fund the State’s retrofit program on a recurring basis, currently funded through fiscal year ending June 30, 2021. Per section 215.559(1)(b), Florida Statutes, the Division is provided \$3.0 million each fiscal year to

retrofit buildings and create hurricane evacuation shelter spaces as prioritized in the annual *Shelter Retrofit Report*. The funds are allocated within the Hurricane Loss Mitigation Program (HLMP) in 215.555(7)(c), Florida Statutes, from the Florida Hurricane Catastrophe Fund. Beginning July 1, 2021, no future funding source has yet been identified for this program.

The Division's public hurricane evacuation shelter deficit reduction strategy focuses on five major components: 1) surveying hurricane evacuation shelter facilities in existing local inventories to identify unused space; 2) surveying facilities not currently listed in local inventories to identify additional and potential space capacity; 3) provide funding for cost-effective retrofit or other mitigation measures on existing buildings that can provide additional capacity; 4) incorporating Public Shelter Design Criteria into new public building construction projects; and, 5) reducing hurricane evacuation shelter demand through improved public information, education and behavioral analysis, and decreased evacuation need.

A significant component of the strategy to increase the availability of public hurricane evacuation shelter space is construction of new school facilities to the Public Shelter Design Criteria of the Florida Building Code, also known as Enhanced Hurricane Protection Area (EHPA) code provisions. School districts within the geographical boundaries of each Regional Planning Council (RPC) region with a deficit of safe spaces are required to build new facilities to accommodate hurricane evacuees. Appendix B illustrates a net gain of 464,700 hurricane evacuation shelter spaces after adoption of the EHPA provisions. The code also specifies that as the deficits are eliminated, the requirement to design and construct schools to the EHPA provisions is eliminated as well. Upon the completion of new EHPA schools, the Division surveys the facilities to determine if they may be added to the inventory or if retrofitting can create additional spaces.

The State has made significant progress toward improving the safety and availability of public hurricane evacuation shelter space. The current capacity of hurricane evacuation shelter spaces is about 10 percent greater than the overall estimated demand on a statewide, cumulative basis. Overall, these metrics are evidence that the comprehensive strategy is an effective means to eliminate deficits. However, RPC regions 6, 7 and 8 (Tampa Bay, Central Florida, and Southwest Florida) still currently reflect deficits region-wide per data from the *2020 Statewide Emergency Shelter Plan* (SESP). As such for General Population (GP) shelter space planning, the code minimum metric is 20 square feet (SF) per space metric. Most regions also reflect deficits for Persons with Special Needs (PSN) that require additional space for medical equipment, electrical support, and care-giver assistance during evacuations.

Safety of the identified shelters is paramount, and changes in FEMA flood and National Weather Service (NWS) storm surge inundation maps have reduced the previously recognized available quantity of hurricane evacuation shelter space in some regions. The inventory of hurricane evacuation shelters has also decreased with the aging of the current stock of public facilities, or the approaching end of the useful life of products in older retrofit projects. As existing buildings constructed to older building codes continue to age, replacement facilities, such as new construction or retrofit of recently constructed facilities, will be needed to ensure that State evacuation space capacities meet both current and future needs.

The cost to retrofit each space has increased over the life of the program while at the same time, the annual allocation has not increased. The average cost per 20 square feet (SF) space prior to 2008 about \$165. Since 2009, and subsequent to increases in construction related costs, the average is now approximately \$240 per 20 SF space. The State retrofit program is the only reliable source of needed retrofit funds. As an example, in RPC regions where the deficit of hurricane evacuation shelter space has been eliminated, no additional EHPA are required to be built. This may leave individual counties with deficits of space no options other than retrofitting existing facilities. The shift to larger space allocations for medical special and functional needs by shelter planners has also increased costs per hurricane evacuation space across the State. Therefore, to keep pace with increasing retrofit construction costs and demand for larger space allocations, the HLMP shelter retrofit program should be increased from current annual funding of \$3.0 million to \$4.5 million.

Provisions of State and national building codes, standards and guidelines for hurricane evacuation shelters are based on the allocation of 20 SF per space. In Florida, if a person requires medical or electrical support during an evacuation, the space allocation is increased to 60 SF to accommodate one special needs client with a caregiver. During the Novel Coronavirus (COVID-19) Health Emergency, the space requirement for all evacuees has been increased to 60 SF. This increase in space allocated allows for social distancing reducing the possibility of COVID-19 transmission, but the effect reduces by two thirds the number of existing recognized evacuation spaces for the current year. This is expected to be a temporary reduction, but the duration of need is unknown.

In summary, as the number of Floridians in areas vulnerable to hurricanes continue to grow, it is vitally important that construction of hurricane evacuation spaces and retrofitting of existing public buildings continues. Full implementation of the Division's shelter deficit reduction strategy can create a greater level of preparedness, a more efficient capability for responding to impacts, and an increased ability to meet the needs of disaster survivors.

I. Introduction

Purpose

Hurricane Andrew made landfall in Miami-Dade County in 1992 as a Category 5 storm – the strongest rating on the Saffir - Simpson Hurricane Wind Scale – and at the time the most destructive tropical cyclone to hit the United States. The impact spurred Florida to look carefully at hurricane preparedness, especially for those who needed to evacuate coastal zones, inland flood or wind damage prone homes, or other vulnerabilities. In 1993, Chapter 252 of the Florida Statutes (FS) added, “It is the intent of the Legislature that this State does not have a deficit of safe public hurricane evacuation shelter space …”. (Sec.252.385(1), Florida Statutes). By the late 1990’s the State’s deficit of safe public hurricane evacuation spaces exceeded one million. The concern for an adequate amount of space to accommodate the expected evacuating populations led to a statewide program of surveying and inventorying facilities that could house evacuees when hurricanes threaten. By direction of the legislation, the Division annually issues the *Shelter Retrofit Report* (report), providing a list of facilities recommended to be retrofitted using State funds. The objective of retrofitting is to improve relative safety and reduce the State’s hurricane evacuation space deficit.

Based on the biennial *Statewide Emergency Shelter Plan* (SESP), the assessments of available spaces in this report reflect only those listed in the SESP that meet the State’s minimum hurricane safety guidelines, which include protection from high winds, coastal storm surge and inland flood waters. Florida adopted the square footage space recommendations set by the American Red Cross (ARC) in the ARC sheltering program in order to standardize the need and evaluate for adequate status of spaces (20 SF per space). The exception to this standard is Persons with Special Needs (PSN) spaces, which by practice in Florida are increased to accommodate equipment and caregiving needs (60 SF per space). This report tracks safe and available hurricane evacuation shelter spaces for Florida and provides an update of State funds used, which is provided to the President of the Senate, the Speaker of the House of Representatives and Governor, and recommends and prioritizes retrofit projects based on each Regional Planning Council (RPC) public hurricane evacuation space status.

Current Situation

In Florida, every county is at risk for hurricane and hurricane-related hazards, including flooding, storm surge, high winds, and power outages. These hazards place specific physical, geographical, and infrastructure limitations on what is recognized as a suitable and safe hurricane evacuation space. Of the State’s sixty-seven counties, thirty-five are located along 8,426 miles of coastline, tidal inlets, bays, and other waterways. Nearly 80% of Florida’s population live in coastal counties, and 40% of the population is in a storm surge evacuation zone. The proximity of population concentrations along the Gulf of Mexico and the Atlantic Ocean, coupled with low coastal elevations, significantly increase the State’s vulnerability to hurricane tidal surges, and storm-related flooding and damage. This vulnerability has manifested itself in the need for hundreds of thousands of public hurricane evacuation spaces. Furthermore, statewide evacuations are not solely a coastal phenomenon. In 2018, Hurricane Michael made landfall as a Category 5 storm and exited the State

through Jackson County as a Category 3. Thus, the impacts of the storm extended well inland to non-coastal counties in Florida and Georgia. Most Florida hurricane evacuation shelters are buildings which serve another public purpose during day to day operations, such as schools and publicly owned civic or recreation centers. Cumulatively, the State has sufficient space available for the general population during evacuations. However, deficits remain in both individual counties and RPC regions.

In response to the COVID-19 Health Emergency, all public hurricane evacuation shelters use 60 SF per space for both GP and Special Needs. Normally, GP hurricane evacuation shelter space capacities are calculated at the standard and code minimum of 20 SF per evacuee, and for PSN the capacity is based on the recommended 60 SF per client. The increase to three times the normal square footage allows social distancing to reduce exposure to the virus. The result of this increase is a reduction in statewide capacity for evacuees by two-thirds. This reduction in capacity creates a deficit in 2020 which has not been seen since the beginning of the retrofit program more than 20 years ago. Further discussion on the impact of COVID-19 is found below in Section III.

Additionally, in 2020, the Legislature recognized the need for shelters that would allow domestic pets to be on site with their owners. Some counties do not have adequate facilities to accommodate pets. Retrofitting of existing, additional space is needed for people who would not otherwise evacuate an unsafe area during a storm without bringing their pet family member to a safe space with them.

For the past two decades the deficit in hurricane evacuation shelter space per expected evacuee has decreased statewide. This has been due to more public-school buildings meeting the EHPA, and additional buildings identified with as-is space, and others retrofitted when needed. To accomplish the retrofits, a dedicated State funding source was specified by the Governor and Legislature within the HLMP (215. 555(7)(c), FS), from part of the Florida Hurricane Catastrophe Fund. Beginning July 1, 2021, no future funding source has yet been identified for this program. At this writing the last allocation of State funds will create the final approximately 12,500 additional spaces. The future safety of all our vulnerable citizens will require additions to the statewide public hurricane evacuation space inventory.

II. Strategy for Public Shelter Deficit Reduction

The Division is responsible for developing a strategy to eliminate the deficit of “safe” public hurricane evacuation shelter space in Florida Statutes; See Secs. 252.385(1) and (3), and in part, 252.35(2)(a)2, Florida Statutes. By the late 1990’s, the statewide deficit of safe public hurricane evacuation shelter space was greater than one million. To accomplish this task, the Division created a multifaceted approach to reduce the deficit of hurricane evacuation shelter spaces. The approach is as follows:

1) Develop and Implement the Model Hurricane Evacuation Shelter Survey Guidelines

The Division is responsible for administering a survey program of existing schools, universities, community colleges, and other State, county, and municipally owned public buildings. Survey criteria include coastal, riverine and lake storm surge, rainfall flooding and high wind hazards, and a basic Least-Risk Decision Making (LRDM) model and report format. The survey reports give preference to building qualities or features that performed well during Hurricane Andrew and avoids (or mitigates) those that performed poorly, and are updated to accommodate modern building codes, standards, guidelines, and practices.

2) Implement Hurricane Evacuation Shelter Survey Program

The Division completed development and implementation of the LRDM survey and report procedures by 1997 and completed the first statewide baseline survey in 2005. The survey program continues as new facilities are constructed and older existing facilities require resurvey and updating. The Hurricane Evacuation Shelter Survey Program continues to improve accuracy and capture changes in the statewide inventory of hurricane evacuation shelters. The results of the surveys are used by State and local agencies to prepare and implement strategies to reduce and eliminate the deficit of recognized hurricane evacuation shelter space. Between 1999 and 2020, more than 6,456 buildings were surveyed utilizing Division surveyors and, from 1999 to 2008, private-sector consultants. The survey program has identified about 247,000 spaces useable as-is in their built, existing condition and, directly or indirectly, led to the creation of more than 349,000 retrofitted spaces in the inventory to date. These totals combined with the EHPA construction of 465,000 evacuee spaces results in a total capacity of 1,061,000 spaces. This capacity uses space standards established prior to the COVID-19 pandemic. The total number of GP spaces in the State’s inventory, when COVID-19 parameters are applied, is reduced by approximately two-thirds.

3) Retrofit Appropriate Facilities to Meet Public Shelter Guidelines

Since 1999, the State Legislature has provided recurring funds for retrofit projects listed in the annual *Shelter Retrofit Report*. The retrofit projects identified through the survey program are recommended only when the retrofit can create spaces that meet the minimum safety criteria upon completion of the project.

For Fiscal Year 2020-2021, the State Legislature appropriated \$3.0 million to structurally enhance or retrofit public hurricane evacuation shelters, which will create an estimated 12,500 additional spaces. The useful lifespan of retrofit products is expected to be about 15 to 20 years.

Even with regular maintenance, products subject to harsh conditions will deteriorate over that span of time. Fiscal Year 2020-2021 may be the final year of committed funds for retrofitting shelter spaces from the program, as the future of the funding has not been determined yet by the State Legislature.

- 4) Incorporate hurricane evacuation shelter design criteria into new public building construction projects

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

Schools are funded primarily by State and local capital outlay funds, and school districts are reporting that the EHPA construction cost premium is about three to nine percent. Since 1997, EHPA construction has created 464,700 spaces which accounts for about 45 percent of the statewide risk recognized space inventory.

- 5) Reduce hurricane evacuation shelter demand through improved public information, education and behavioral analysis, and a decreased need for evacuation.

Hurricane evacuation studies have historically indicated that at least 25 percent of a vulnerable population would seek public shelter during an evacuation event. However, recent studies indicate that only about 15 percent will seek public shelter. This is consistent with the findings of recent post-storm assessments that indicate less than 10 percent of vulnerable populations sought public shelter. Although the percentage reduction in shelter use changes the demand formula, the growth of the population in the State offsets any real reduction in space needs. As of this writing, percentage demand is stable but increasing proportionally with vulnerable population numbers despite the observed behavioral change. Consequently, inventories of evacuation spaces will need to keep pace.

However, changes in FEMA flood and NWS storm surge maps coupled with recent population and demographic trends reflected in evacuation studies created a significant increase in space demand beginning in 2016, which continues to impact demand. Specifically, forecasting for the five-year period indicates higher demand for special needs shelters. These demand figures do not account for the aging of the current stock of public shelters nor the approaching end of the useful life of the original retrofit products. The *2020 Statewide Regional Evacuation Studies* (SRES) resulted in a small statewide aggregate hurricane evacuation shelter space decrease in demand spaces. Florida's aggregate statewide hurricane evacuation shelter space demand found in Table B-1 (see Appendix B) is 955,700 spaces for 2020, with a projected demand of 966,500 by 2025. As of this writing, a new evacuation demand study is in process.

III. Statewide Progress in Shelter Deficit Reduction

Since 1995, Florida has made significant progress toward improving the safety and availability of public hurricane evacuation shelter space. The comprehensive strategy of surveys, retrofitting, new construction, evacuation studies, and public education is the basis for this success. An expansion in storm surge/evacuation zones, aging building stock, and decommissioned school buildings plus changes in planned local school room use has resulted in a decrease of nearly 20 percent of the inventory of available spaces since 2012. From these actions, the Division prepares the biennial *Statewide Emergency Shelter Plan* (SESP) to assess the current and projected shelter space sufficiency and deficit. The chart below compares the findings of the studies conducted since 2012.

Table 3-1.

Statewide Shelter Space Sufficient / Deficit in Evacuee Spaces		
Year	General Population	Special Needs
2012	125,205	-20,829
2014	88,601	-14,218
2016	74,567	-23,431
2018	100,027	-19,956
2020	113,989	-9,139

For a more in-depth look at the spaces created through retrofitting of existing facilities using state funds, and spaces created through design and construction of new public-school facilities to EHPA code provisions while showing the estimated shelter demand for 2020, please review *Hurricane Evacuation Space Deficit Reduction Progress 2019-2020, Post - 1995 Capacity Success Stories* in Appendix B.

However, there is still more work to be done regarding reduction of the evacuation space deficit. In the most recent (2020) SESP, there are three main areas of concern. First, capacity for the general population statewide include approximately 115,574 retrofitted spaces completed or under construction after 2012 in this program (see Appendix B, Table B-1). Without the retrofitted spaces, the 2020 overall statewide sufficiency would fall back into deficit levels. Second, spaces for special populations such as people with pets that need to shelter or persons who are medically or electrically dependent are still in deficit despite retrofit additions over the same period. Third, there are three (3) RPC regions that have GP space deficits: Central Florida, Tampa Bay, and Southwest Florida. These regions also have some of the highest evacuation clearance times in the State. Further, the populations have increased significantly over time. Because it takes longer than average to travel outside the region to find safe shelter, the internal space capacity of the Central Florida, Tampa Bay, and Southwest Florida regions is critical for providing residents safe options. The statewide sufficiency itself does not reflect the need in these regions of concern. Table 3-2 demonstrates how the gap has increased since 2012.

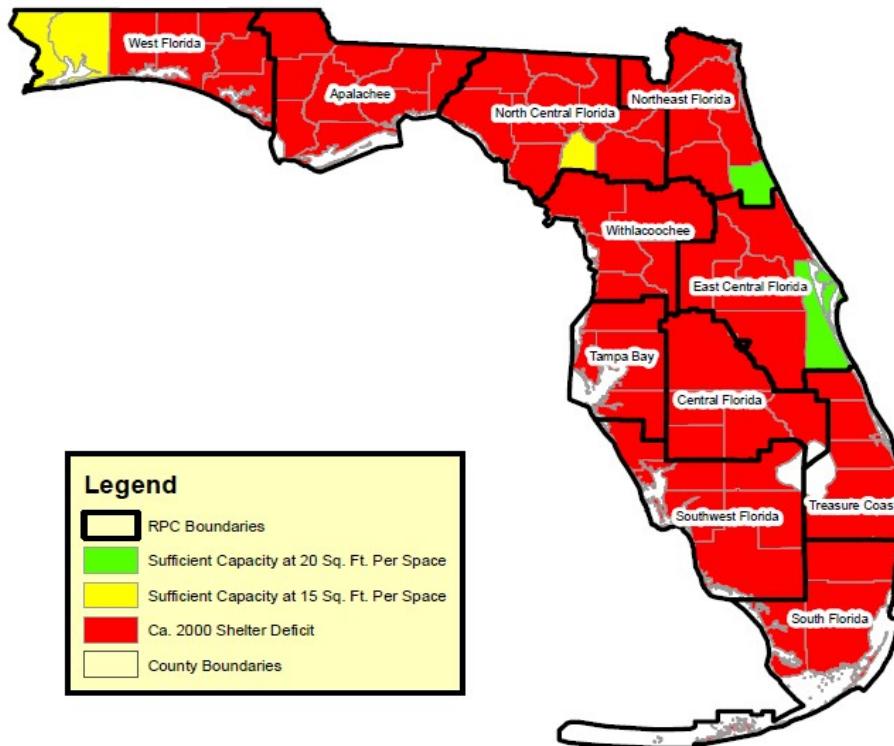
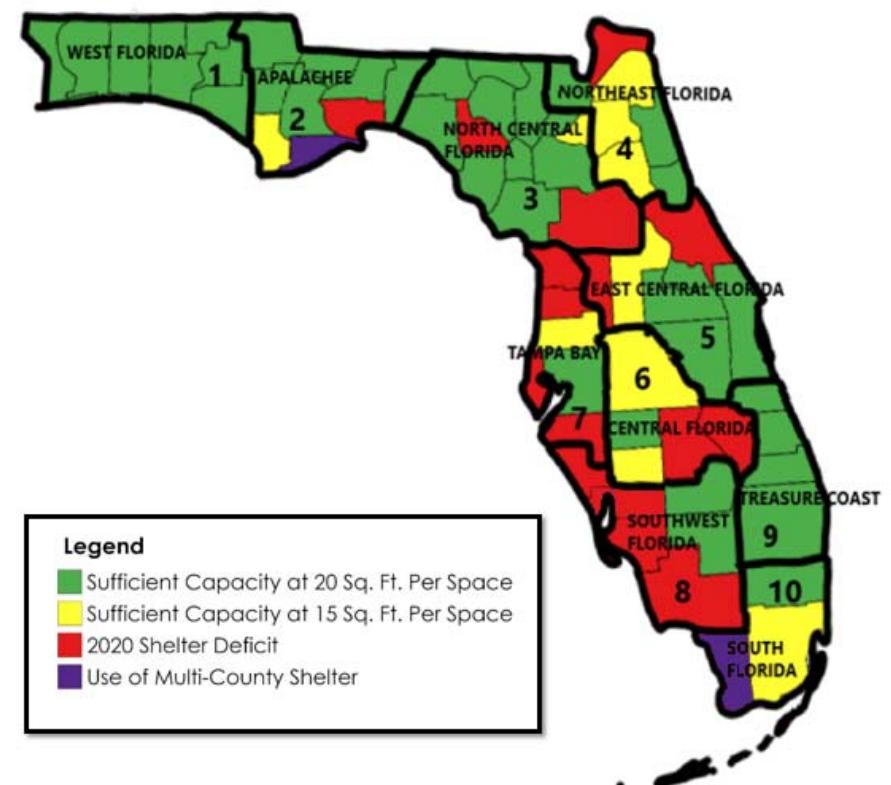
Table 3-2.

General Population Shelter Sufficient / Deficit in Select RPC in Evacuee Space		
Region	2012	2020
Central Florida	10,276	-10,492
Tampa Bay	50,750	-14,314
Southwest Florida	-80,115	-107,791

As the population of Florida continues to grow and development continues in risk-prone areas, the need for suitable hurricane evacuation facilities will continue to increase. New construction is an ideal solution but does not keep pace with the increased need for GP spaces. On the contrary, as buildings age (e.g., obsolescence or unserviceable conditions, building code changes, cladding and retrofit product deterioration) or are decommissioned due to mass care incompatibility with ordinary use during “blue skies,” (no emergency incidents occurring) the available spaces during “gray skies” (emergency incidents occurring) shrinks. In 2020, the State has five (5) regions with deficits in buildings and spaces equipped to evacuate PSN. The five-year projection of deficits shows an increase in GP and PSN evacuation spaces over and above the numerical deficit now. Retrofit projects augment the gaps and allows the State to more rapidly meet its needs.

As communities experience events during “gray skies” that are declared Major Disasters triggering FEMA’s Public Assistance grant program, there is an additional funding opportunity available to them to accomplish shelter retrofits. As public facilities and buildings are restored, repaired or rebuilt, upgrades required by codes and standards are eligible for funding under the Public Assistance program. Additionally, Stafford Act section 406 funding provides discretionary authority for FEMA to fund mitigation measures in conjunction with the repair of the disaster-damaged facilities. However, this funding is limited to declared counties and eligible damaged facilities. The 406 grant is managed by the State under funding provided for in the Stafford Act. Section 406 mitigation measures are funded under the Public Assistance, or Infrastructure, program (PA). Section 406 mitigation funding is applied on the parts of the facility that were damaged by the disaster and the mitigation measures directly reduce the potential of future, similar disaster damages to the eligible facility.

The maps presented in Figures 3-1 and 3-2 underscore the value of this program for the State of Florida. The map in Figure 3-1 shows which Florida counties had deficits in 2000. Figure 3-2 indicates the current deficits based on the latest available data from 2020.

2000 County Hurricane Evacuation Shelter Space Deficit & Sufficiency Status of General Population Shelters**Figure 3-1.****2020 County Hurricane Evacuation Shelter Space Deficit & Sufficiency Status of General Population Shelters****Figure 3-2.**

Impacts of the COVID-19 Health Emergency

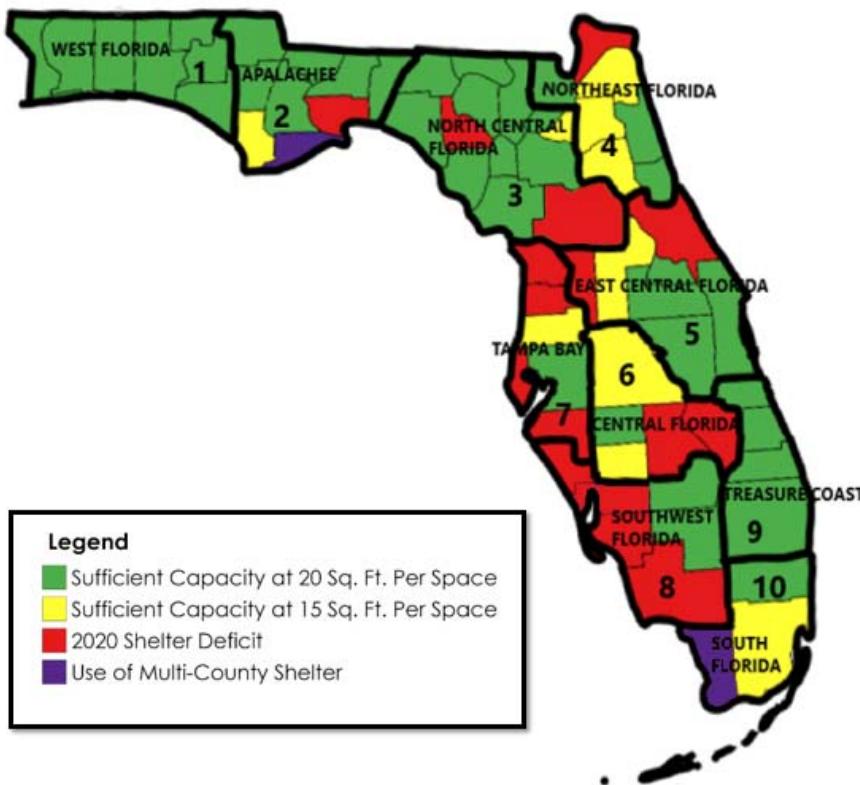
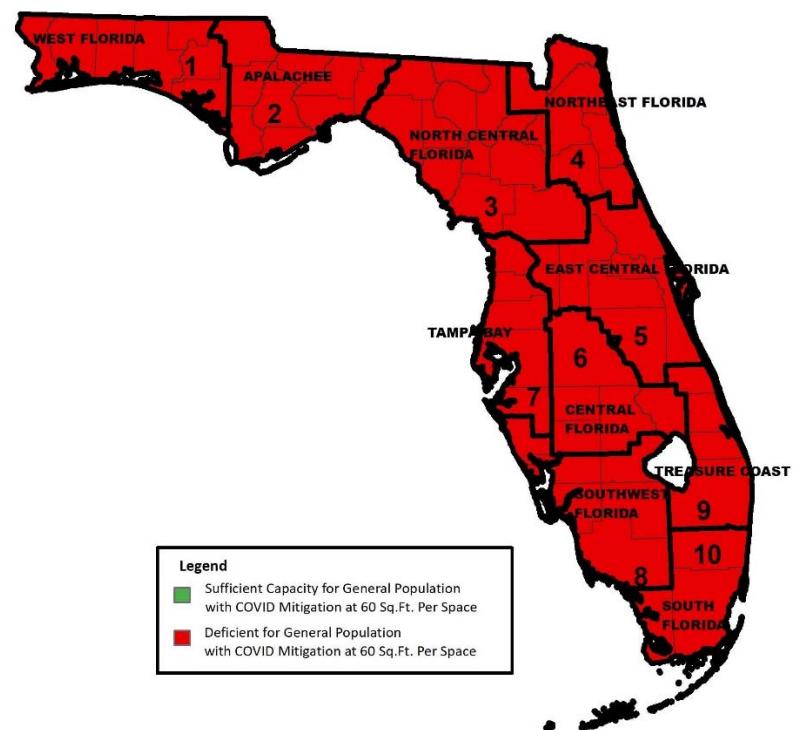
Due to the ongoing COVID-19 Health Emergency, additional shelter recommendations are now in place to slow the spread of COVID-19. As a result of these new recommendations, available shelter space capacity has been reduced. GP hurricane evacuation space capacities are calculated at the code minimum of 20 SF per evacuee, however, due to the COVID-19 Health Emergency, hurricane evacuation shelters now require 60 SF per evacuee. For PSN clients, shelter capacity has remained at 60 SF per evacuee. The required square footage increase for GP shelters is three times the minimum square footage standard. Evacuees included in the GP group are the vast majority of those served during a hurricane activation. The additional space requirement is to allow for social distancing to protect against exposure to COVID-19.

Evacuees positive for COVID-19 or those who have had a recent exposure need to be socially distanced and isolated from other evacuees. To assist COVID-19 related sheltering needs, FEMA has allowed reimbursement for non-congregate sheltering which mitigates a portion of the space constraints during evacuations.

The impact of social distancing requirements on available space is considerable. This reduction in capacity creates a shelter space deficit situation which has not been seen since the beginning of the retrofit program more than 20 years ago. The capacity of each GP hurricane evacuation shelter is now one third of what it was prior to March 2020. As a result, zero of the 67 counties in the State of Florida have enough capacity to accommodate their general population based upon the COVID-19 space criteria. The current – and expectedly temporary – pandemic underscores the need for retrofitting and for on-going funding of the program.

At the preparation of this report it is unknown how long the threat and necessary precautions from COVID-19 will last. Consequently, the need for preparation for hazards with unexpected complications in evacuation space requirements is emphasized.

The maps presented in Figures 3-3 and 3-4 underscore the impact for the State of Florida under COVID -19 shelter space criteria. The map in Figure 3-3 indicates the current space status based on the latest available data from 2020 for reference. The map in Figure 3-4 illustrates which Florida counties have shelter space deficits as a result of reconfiguring spaces in response to the virus.

2020 County Hurricane Evacuation Shelter Space Deficit & Sufficiency Status of General Population Shelters**Figure 3-3.****2020 County Hurricane Evacuation Space Deficit & Sufficiency Status of General Population Shelters, Post COVID-19****Figure 3-4.**

Impacts of Funding Cessation

The projects recommended within this report, if funded, will continue the substantial improvement of Florida's hurricane evacuation preparedness at both the State and local levels. The State Legislature and the Governor have demonstrated a commitment to reducing the deficit of safe public hurricane evacuation shelter space and ensuring vulnerable Floridians are protected from the worst effects of devastating storms. However, currently, the funding for fiscal year 2020 – 2021 is the last year of committed funds for retrofitting shelter spaces through the program.

The State retrofit program is the only reliable source of needed retrofit funds. As an example, in RPC regions where the deficit of hurricane evacuation shelter space has been eliminated, by statute and code no additional EHPA are required to be built. This may leave individual counties with deficits of space with no other options for retrofitting existing facilities. Also, the shift by public shelter planners to larger space allocations and need for mechanical and electrical system support for PSN and functional needs clients has also increased costs per hurricane evacuation shelter space across the State. However, the cost to retrofit each space has increased during the life of the program but the annual allocation has not increased. The running average was approximately \$165 per 20 SF space prior to 2008. Since improvement in the economy after 2009, and subsequent increases in construction related costs, the average is now closer to \$240 per 20 SF space. Accordingly, retrofit shelters for PSN clients and others with functional needs require three times the average cost of a GP space. To keep pace with increasing retrofit construction costs and demand for larger space allocations, the HLMP shelter retrofit program should be increased from current annual funding of \$3.0 million to \$4.5 million.

As illustrated in Table 3-3, from 1999 to 2013 about \$80 million in federal and State funds have been committed towards retrofitting suitable facilities, which funded about 486,000 hurricane evacuation shelter spaces. It is noted that the federal funding was allowed through a separate program in years 1999-2002. Subsequent changes in the federal guidelines and definitions of the term "shelter" has meant that federal funding for hurricane evacuation shelter retrofitting is no longer available. Beginning in 2003, only State funds allocated from the HLMP have been used for retrofitting. From 2014 to 2020, an additional \$21 million in State funding was committed to adding approximately 86,350 new or replacement spaces through retrofitting. With the continued growth of Florida's population, the need for shelter space will continue and if the funding is not renewed the preparedness of Florida's hurricane response will be severely diminished at both the State and local levels.

Table 3-3. Historical Summary of Florida's Hurricane Evacuation Shelter Retrofit Program					
Shelter Retrofit Report Year	Annual Recommended Project Cost	Potential Number of Spaces if Funded	Federal and State Funds Allocated to Retrofitting	Retrofitted Spaces Gained by Year	Total Retrofit Spaces Gained
1999	\$16,185,193	88,679	\$8,473,341	72,230	72,230
2000	\$36,399,457	250,362	\$25,572,795	119,087	191,317
2001	\$26,943,516	119,905	\$5,233,731	20,574	211,891
2002	\$26,959,668	157,326	\$4,735,113	41,710	253,601
2003	\$23,349,714	137,985	\$3,000,000	33,381	286,982
2004	\$13,457,737	93,967	\$7,500,000	68,765	355,747
2005	\$11,882,722	68,882	\$3,000,000	24,481	380,228
2006	\$8,683,049	54,415	\$3,000,000	13,820	394,048
2007	\$10,956,377	82,930	\$6,607,263 ^b	25,645 ^a	419,693
2008	\$13,432,213	85,997	\$0	0 ^c	419,693
2009	\$11,777,884	69,465	\$3,000,000	14,427	434,120
2010	\$15,634,282	120,447	\$1,750,000	7,920 ^d	442,040
2011	\$20,337,203	109,308	\$2,250,000	14,974	457,014
2012	\$14,707,717	110,394	\$3,000,000	14,408	471,422
2013	\$12,745,072	87,150	\$3,000,000	14,810	486,232
2014	\$13,994,180	107,236	\$3,000,000	12,691 ^e	498,923
2015	\$15,188,945	117,609	\$3,000,000	11,165 ^e	510,088
2016	\$13,465,342	69,541	\$3,000,000	12,500 ^e	522,588
2017	\$13,794,763	65,303	\$3,000,000	12,500 ^e	535,088
2018	\$23,189,218	108,104	\$3,000,000	12,500 ^e	547,588
2019	\$30,864,820	141,050	\$3,000,000	12,500 ^e	560,880
2020	\$27,068,133	114,226	\$3,000,000	12,500 ^e	572,588 ^f
TOTAL	N/A	N/A	\$101,122,243	N/A^g	N/A

^a – \$6,607,263 was based on federal funds plus state match for FY 2007/2008 HB7121 and non-federal matched projects from Special Appropriation 1621X

^b – 25,645 spaces were gained from HB 7121 & 1621X shelter retrofit projects

^c – For Fiscal Year 08-09, no funds were appropriated for the Shelter Retrofit Report

^d – 7,929 reflects gain from FY 2010/2011 Specific Appropriation 1617 @ \$1,750,000

^e – 12,500 spaces is preliminary estimate gained based upon \$240 per space from annual \$3,000,000 Specific Appropriation in fiscal years where funding is obligated or under contract.

^f – 573,230 reflects all gains, to include current projects under contract and estimates from Specific Appropriations

^g – No spaces are projected for FY 2021-2022 because no funds have been allocated at publication of this report

IV. Recommendations

Shelter Retrofit Project Identification Procedure

While the Division's hurricane evacuation shelter survey work acts as the basis for data used to compile the report, the Division recognizes local professionals are aware of public spaces and are positioned to make the best recommendations to serve their communities. The *2020 Shelter Retrofit Report* is a collaborative effort between the local school boards, public and private agencies, and county emergency managers. County emergency managers report changes or updates annually to their local shelter planning and to the Division as a contribution to the report's data. Other information is provided by Florida's Department of Management Services and FDOE, whose buildings are the primary cohort of public evacuation shelter space.

All the data is compiled into a potential project list to determine if a facility could meet the Division's Least Risk Decision Making (LRDM) safe shelter guidelines once completed. Costs are estimates as determined by local agencies, commercial contractors, professional opinions as to probable cost to build or, in some cases, experience in the retrofit program. Division staff review the potential projects and award point values based upon the need for additional shelter space in the RPC region and county.

The State's criteria consist of the following:

- Regional and Local Shelter Space Deficits
- Structural and Hazard Vulnerability Review, including flood and storm surge
- Shelter Capacity Increase, Building Ownership and Availability, and Cost-Effectiveness Considerations
- Other Considerations / Demonstration of Impact Upon the State and Regional Shelter Deficit Situation and Special Populations (e. g., medical needs, electrically dependent and pet-friendly availability).

For more details on each criterion, please review *Methodology for Prioritizing Projects for Funding* in Appendix C.

FY 2019 – 2020 Projects

In fiscal year 2019-2020, the Division requested county emergency managers submit new hurricane evacuation shelter retrofit projects and confirm or delete any projects on the current *Shelter Retrofit Report* lists. Each proposed retrofit project is required to rank as either "preferred" or "less preferred/marginal" for all survey criteria on the respective LRDM report when the project is complete. The Division identified 287 projects able to meet the standard after retrofitting. All projects were ranked using factors such as: regional and local (county) hurricane evacuation shelter space deficit; greatest provision of space; cost efficiency per space; and vulnerability to high winds and storm surge. For the complete list of recommended and prioritized projects see Appendix A.

Table 4-1 provides a summary of the proposed shelter retrofit projects, the RPC and county served, the construction-related estimated costs of the proposed projects, and the total hurricane evacuation shelter space capacity that will be created upon completion.

Table 4-1.			
2020 Shelter Retrofit Report County and Regional Recommended Project Totals			
31-Aug-20			
Regional Planning Council (RPC) #	County	SRR Project Estimate	Spaces Added
Region 1 - West Florida			
1	Bay	\$715,635	2,617
1	Walton	\$1,158,900	4,181
Region 1 Totals:		\$1,874,535	6,798
Region 2 - Apalachee			
2	Calhoun	\$193,500	1,000
2	Gadsden	\$763,223	2,057
2	Jackson	\$225,000	100
2	Leon	\$1,071,325	4,343
2	Liberty	\$127,500	937
2	Suwanee	\$75,000	pet
2	Wakulla	\$1,173,825	5,217
Region 2 Totals:		\$3,629,373	13,654
Region 3 - North Central Florida			
3	Alachua	\$1,216,825	5,227
3	Bradford	\$250,000	1,063
3	Columbia	\$417,822	1,147
3	Hamilton	\$674,100	2,996

3	Taylor	\$412,720	1,876
Region 3 Totals:		\$2,971,467	12,309
Region 4 - Northeast Florida			
4	Clay	\$160,000	285
4	Duval	\$548,925	3,745
4	Flagler	\$528,325	2,965
4	Nassau	\$854,875	4,116
Region 4 Totals:		\$2,092,125	11,111
Region 5 - East Central Florida			
5	Lake	\$436,515	1,565
5	Marion	\$16,000	295
5	Orange	\$2,683,393	16,814
5	Osceola	\$1,272,450	1,522
5	Seminole	\$215,780	1,595
5	Sumter	\$345,600	1,565
5	Volusia	\$1,588,150	6,268
Region 5 Totals:		\$6,557,888	29,624
Region 6 - Central Florida			
6	DeSoto	\$490,825	1,859
6	Hardee	\$254,900	220
6	Highlands	\$721,875	1,735
6	Okeechobee	\$190,000	1,160
6	Polk	\$212,625	945
Region 6 Totals:		\$1,870,225	5,919
Region 7 - Tampa Bay			
7	Citrus	\$160,000	858
7	Hernando	\$410,692	1,750

7	Manatee	\$429,563	3,574
7	Pasco	\$3,357,875	9,383
7	Pinellas	\$624,970	2,063
Region 7 Totals:		\$4,983,100	17,628
Region 8 - Southwest Florida			
8	Charlotte	\$261,250	1,050
8	Glades	\$52,875	235
8	Lee	\$726,690	5,015
8	Sarasota	\$297,080	3,776
Region 8 Totals:		\$1,337,895	10,076
Region 9 - Treasure Coast			
9	Indian River	\$40,800	184
9	Martin	\$405,725	2,881
9	Palm Beach	\$111,500	500
9	St. Lucie	\$230,000	882
Region 9 Totals:		\$788,025	4,447
Region 10 - South Florida			
10	Broward	\$770,000	1,800
10	Miami-Dade	\$193,500	860
Region 10 Totals:		\$963,500	2,660

If funded, the projects listed in this report will provide an estimated increase of 114,226 hurricane evacuation shelter spaces at a cost of \$27,068,133 (Estimated construction-related costs). Projects that include a standby electric power source add to the overall functionality and sustainability of a shelter, but do not increase shelter space capacity.

V. Conclusion

The Division recognizes the necessity of providing safe hurricane evacuation shelter space for Floridians. Hurricane Andrew (1992) demonstrated this need, and following Hurricane Floyd, the Lewis Commission (1999 Commission Report) concurred. The State remains committed to providing safe hurricane evacuation shelter space for those needing it. Through funding of the recommended projects in the *2020 Shelter Retrofit Report*, Florida will continue to see improvements in shelter space capacity.

Since 1995 hurricane evacuation shelter spaces have been identified, or created through retrofitting of existing facilities, or by new construction to public shelter design standards and code provisions. Recently some hurricane evacuation shelters have been decommissioned due to new obsolescence or unserviceable conditions, remodeling or reuse that is incompatible with mass care shelter operations, deterioration or removal of protection products, or other causes. Changes in storm hazard maps (e.g., SLOSH, national flood insurance, etc.) also affect a site's ability to be risk recognized. Therefore, the *2020 Shelter Retrofit Report* of available hurricane evacuation shelter space totals 1,060,767 shelter spaces.

In 2015, an additional provision, Sec. 252.355, Florida Statutes, established new requirements for special needs client registries. The additional statutory provision increased demand. In 2016, and in the following years, changes in evacuation studies, demographics and public awareness increased the demand for PSN spaces. PSN require more floor area space and other accommodations per client. They are more expensive to retrofit, as the spaces generated per dollar invested are fewer. As a result, 34 of Florida's 67 counties have a PSN client space deficit in 2020. The GP and PSN combined shelter demand in fiscal year 2020-2021 is 955,713 spaces.

The 287 projects previously described in this report are recommended for completion at an estimated cost of \$27,068,133. Upon completion of these projects, an additional 114,200 spaces at 20 SF per person could be created, resulting in 1,234,400 spaces available to be used for risk hurricane evacuation sheltering. Some projects could receive greater funding for special needs retrofitting, which are designated at the county level. The increased funding requirement would reduce overall spaces but is necessary to provide a haven for Florida's most vulnerable populations.

In 2020, three (3) regions of the State still report a deficit of hurricane evacuation shelter space in general population space. Regions that have an adequate number of hurricane evacuation shelter spaces currently will need to maintain their inventory. Since 2017, more than 65,000 spaces previously risk recognized were removed from inventory due to changes in hazard maps (e.g., surge and flood maps). The recently released maps will continue to affect more facilities' recognition of meeting hurricane safety criteria. Over time, other hurricane evacuation shelters will be decommissioned due to aging or changes in use. Thus, even though the aggregate statewide deficit is reduced in the *2020 Shelter Retrofit Report*, a maintenance level of shelter space production will be necessary to avoid falling back into an overall deficit situation.

The GP Shelters in all but three regions have kept pace with population growth as discussed in this report. In 2020, when faced with the COVID-19 Health Emergency, GP Shelters began requiring additional floor space per person to mitigate against the spread of the virus. As a result, under COVID-19 sheltering conditions, no RPC region nor any of the 67 counties have sufficient GP spaces for their residents.

Meeting the sheltering needs in Florida requires multiple tactics among State and local partners. The *Shelter Retrofit Report* presents the Division's procedures and courses of action for addressing capacity concerns. Table 3-1 summarizes the Division's recommendations on projects that will add more than 114,200 additional shelter spaces, if funded. Retrofitting existing buildings that are used for more than one purpose on a day to day basis is a cost-effective and necessary method of increasing the space capacity for evacuees during hurricanes and other disasters in the State.