

State of Florida 2020 Shelter Retrofit Report

November 2020



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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

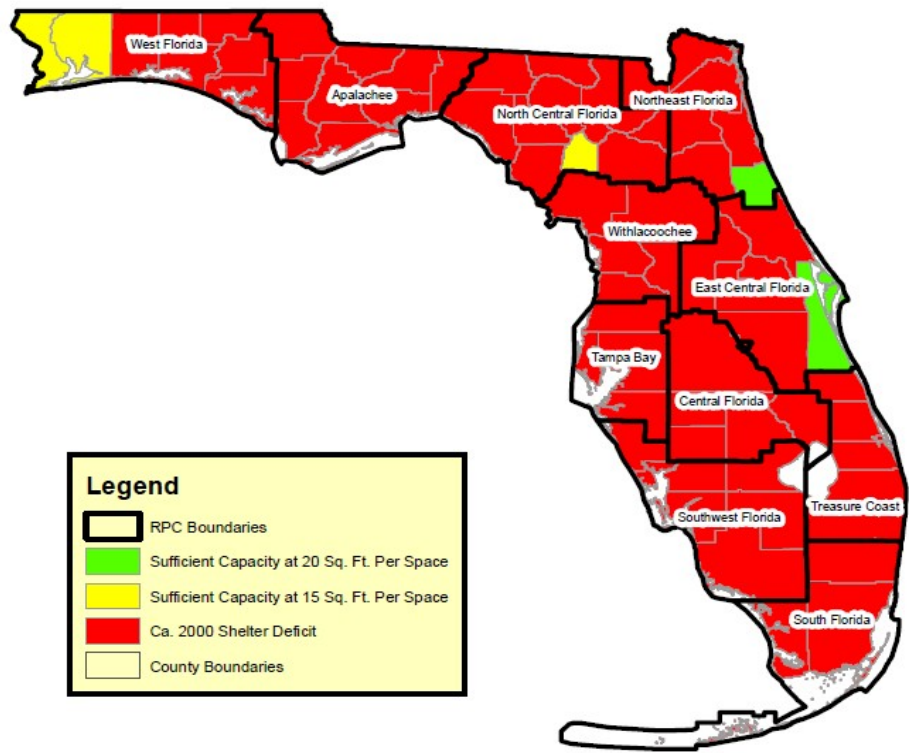
As the population of Florida continues to grow and development continues in risk-prone areas, the need for suitable hurricane evacuation facilities will continue to increase. New construction is an ideal solution but does not keep pace with the increased need for GP spaces. On the contrary, as buildings 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.

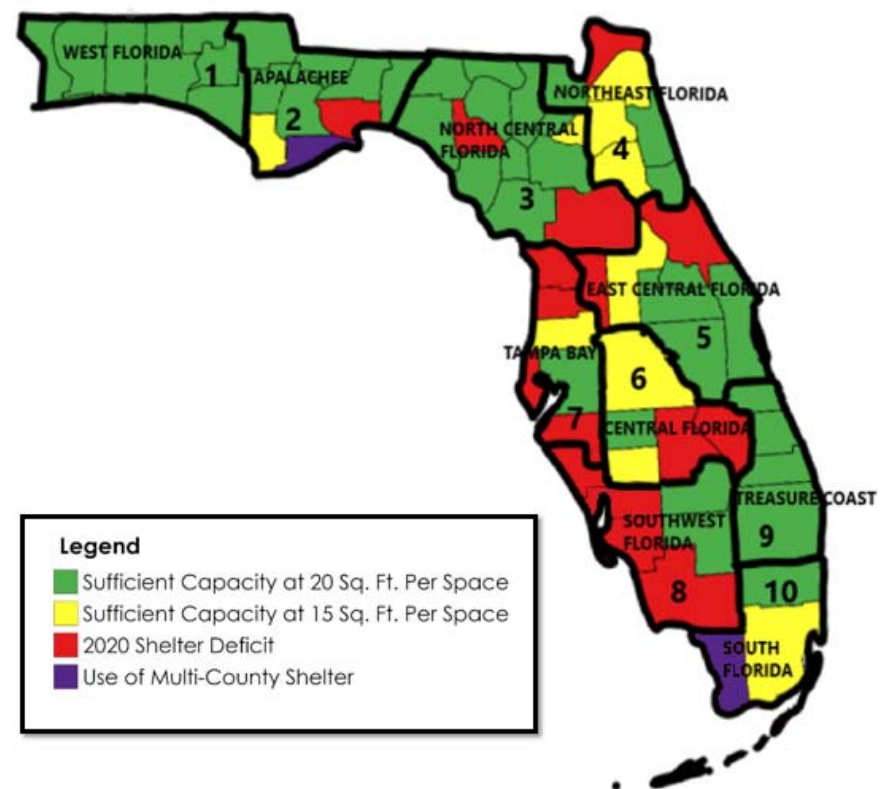
2000 County Hurricane Evacuation Shelter Space Deficit & Sufficiency Status of General Population Shelters

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.

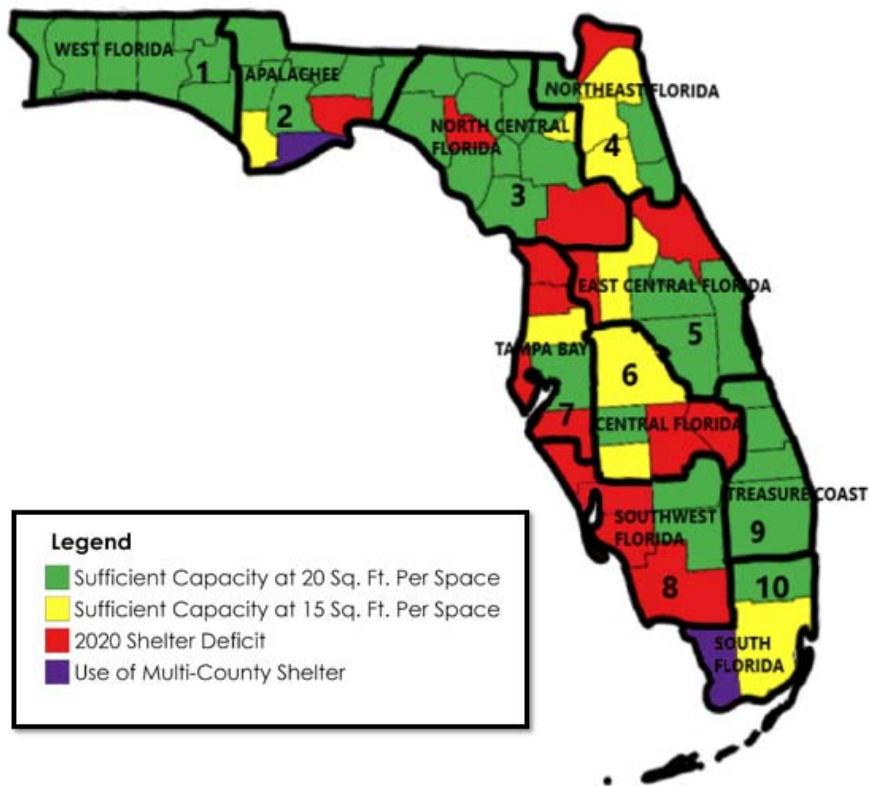
The impact of social distancing requirements on available space is considerable. This reduction in capacity creates a shelter space deficit situation which has not been seen since the beginning of the retrofit program more than 20 years ago. The capacity of each GP hurricane evacuation shelter is now 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.

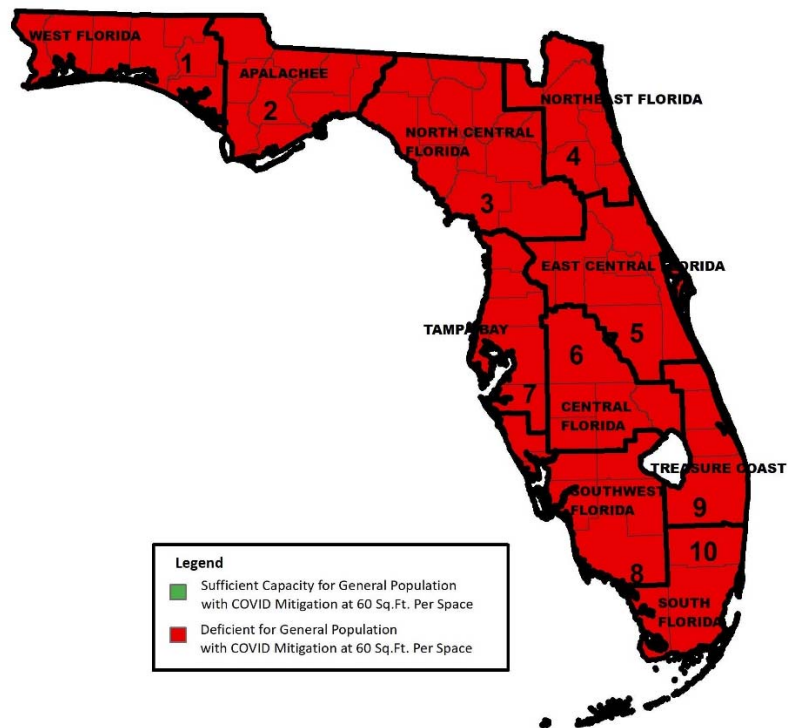
2020 County Hurricane Evacuation Shelter Space Deficit & Sufficiency Status of General Population Shelters

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 9 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.

Appendix A

2020 Shelter Retrofit Report County and Regional Recommended Projects

Table A-1.								
2020 Shelter Retrofit Report County and Regional Recommended Projects								
31-Aug-20								
Regional Planning Council (RPC) #	County	Site Name/Bldg ID	Year Built	Spaces to be Added	Project Description	SRR Project Estimate	Cost per Space	Origin SRR Year
Region 1 - West Florida								
1	Bay	Bay County Library	2006	1030	Fenestration Protection	\$310,950	\$302	2020
1	Bay	Moseley HS Media	2004	736	Fenestration Protection	\$187,680	\$255	2020
1	Bay	Mowat MS Gym	2009	851	Fenestration Protection	\$217,005	\$255	2020
1	Walton	Freeport SHS 1 Main	2001	1310	GenSet Protect Enclosure	\$126,000	\$96	2019
1	Walton	Mossy Head D CR	2006	307	Fenestration Protection	\$162,450	\$529	2020
1	Walton	Mossy Head E Caf	2006	336	Fenestration Protection	\$175,650	\$522	2020
1	Walton	Walton MS AB CR	2012	194	Fenestration Protection	\$145,875	\$751	2020
1	Walton	Walton MS C CR	2012	194	Fenestration Protection	\$88,950	\$458	2020
1	Walton	Walton MS DE Gym	2012	744	Fenestration Protection	\$54,900	\$73	2020
1	Walton	Walton MS FG CR	2012	157	Fenestration Protection	\$96,300	\$613	2020
1	Walton	Walton MS FHJ Media	2012	266	Fenestration Protection	\$89,700	\$337	2020
1	Walton	Walton MS MQ CR	2012	236	Fenestration Protection	\$56,400	\$238	2020
1	Walton	Walton MS NP CR	2012	159	Fenestration Protection	\$46,800	\$294	2020
1	Walton	Walton MS R CR	2012	90	Fenestration Protection	\$25,650	\$285	2020
1	Walton	Walton MS S Admin	2012	107	Fenestration Protection	\$58,275	\$544	2020
1	Walton	Walton MS T CR	2012	81	Fenestration Protection	\$31,950	\$394	2020
Count								
16	Region 1 Totals:			6,798		\$1,874,535		
Region 2 - Apalachee								
2	Calhoun	Altha ES 2 CR	2015	422	Fenestration /GenSet	\$64,500	\$500	2019
2	Calhoun	Altha ES 5 CR	2015	449	Fenestration/GenSet	\$64,500	\$500	2019
2	Calhoun	Blountstown HS	2011	129	Fenestration /GenSet	\$64,500	\$500	2018
2	Gadsden	Gadsden County HS 2 Media	2001	525	Fenestration Protection	\$118,125	\$225	2018
2	Gadsden	Gadsden County HS 3 CR	2001	525	Fenestration Protection	\$118,125	\$225	2018
2	Gadsden	West Gadsden MS 6 Music	2005	104	Fenestration Protection	\$23,400	\$225	2018
2	Gadsden	Greensboro ES (aka HS) 2 CR	1994	454	Fenestration Protection	\$68,061	\$150	2015
2	Gadsden	Greensboro ES (aka HS) 3 Caf	1994	187	Fenestration Protection	\$45,952	\$246	2015
2	Gadsden	Havana MS CR	1992	162	Fenestration Protection	\$164,560	\$1,016	2015
2	Gadsden	Gadsden Community Hospital	tbd	100	Need LRDM	\$225,000	\$225	2020
2	Jackson	Graceville HS	tbd	100	Need LRDM	\$225,000	\$225	2020

Table A-1.								
2020 Shelter Retrofit Report County and Regional Recommended Projects								
31-Aug-20								
Regional Planning Council (RPC) #	County	Site Name/Bldg ID	Year Built	Spaces to be Added	Project Description	SRR Project Estimate	Cost per Space	Origin SRR Year
Region 2 - Apalachee								
2	Leon	FAMU DRS 3 CR	2007	672	Fenestration Protection	\$183,975	\$274	2012
2	Leon	FAMU DRS 5 CR	2007	532	Fenestration Protection	\$119,700	\$225	2012
2	Leon	FAMU DRS 6 CR	2007	557	Fenestration Protection	\$40,500	\$73	2012
2	Leon	Lawton Chiles HS 9 CR	2004	344	Fenestration Protection	\$40,275	\$225	2019
2	Leon	Augusta RAA MS 4 CR	2004	227	Fenestration Protection	\$51,075	\$225	2019
2	Leon	Augusta RAA MS 6 CR	2007	186	Fenestration Protection	\$41,850	\$225	2019
2	Leon	Lawton Chiles HS 14 CR	2007	180	Fenestration Protection	\$40,500	\$225	2019
2	Leon	Lawton Chiles HS 6 Gym	1998	618	Engineering / Fenestration	\$139,050	\$225	2018
2	Leon	Woodville ES 8 Cafeteria	2015	154	Fenestration Protection	\$34,650	\$225	2019
2	Leon	Augusta RAA MS 18 Cafeteria	2004	148	Fenestration Protection	\$33,300	\$225	2019
2	Leon	Lawton Chiles HS 7 CR	1998	307	Fenestration Protection	\$69,075	\$225	2018
2	Leon	Lawton Chiles HS 8 CR	1998	227	Fenestration Protection	\$51,075	\$225	2018
2	Leon	Lawton Chiles HS 5 Aud	1998	105	Engineering/ Fenestration	\$136,125	\$225	2019
2	Leon	Lawton Chiles HS 3 Cafeteria	1997	46	Engineering/ Fenestration	\$73,575	\$225	2019
2	Leon	FAMU DRS 2 Admin/Media	2007	40	Fenestration Protection	\$16,600	\$415	2012
2	Liberty	New HS 1 CR	2020	395	Fenestration Protection	\$41,250	\$104	2020
2	Liberty	New HS 2 Admin & Art	2020	147	Fenestration Protection	\$45,000	\$306	2020
2	Liberty	New HS 3 CR	2020	395	Fenestration Protection	\$41,250	\$104	2020
2	Suwanee	Suwanee ES	2008	pet	Fenestration Protection	\$75,000	\$225	2020
2	Wakulla	Crawfordville ES 2 CR	2002	330	Fenestration Protection	\$74,250	\$225	2018
2	Wakulla	Crawfordville ES 3 CR	2002	243	Fenestration Protection	\$54,675	\$225	2018
2	Wakulla	Crawfordville ES 5 CR	2002	255	Fenestration Protection	\$57,375	\$225	2018
2	Wakulla	Crawfordville ES 6 CR	2002	294	Fenestration Protection	\$66,150	\$225	2018
2	Wakulla	Crawfordville ES 7 CR	2002	270	Fenestration Protection	\$60,750	\$225	2018
2	Wakulla	Riversink ES 2 CR	2007	435	Fenestration Protection	\$97,875	\$225	2018
2	Wakulla	Riversink ES 3 Cafeteria	2007	312	Fenestration Protection	\$70,200	\$225	2018
2	Wakulla	Riversink ES 5 CR	2007	446	Fenestration Protection	\$100,350	\$225	2018
2	Wakulla	Riversink ES 6 CR	2007	398	Fenestration Protection	\$89,550	\$225	2018
2	Wakulla	Shadeville ES 3A CR	2002	78	Fenestration Protection	\$17,550	\$225	2018
2	Wakulla	Shadeville ES 3B CR	2002	77	Fenestration Protection	\$17,325	\$225	2018
2	Wakulla	Crawfordville ES 4 CR	2002	27	Fenestration Protection	\$6,075	\$225	2018
2	Wakulla	Riversink ES 4	2007	27	Fenestration Protection	\$6,075	\$225	2018
2	Wakulla	Shadeville ES 1A	1989	473	Fenestration Protection	\$106,425	\$225	2018
2	Wakulla	Shadeville ES 8 CR	1992	312	Fenestration Protection	\$70,200	\$225	2018
2	Wakulla	Riversprings MS 1A	1999	223	Fenestration Protection	\$50,175	\$225	2018
2	Wakulla	Riversprings MS 1B	1999	227	Fenestration Protection	\$51,075	\$225	2018
2	Wakulla	Riversprings MS 1C	1999	268	Fenestration Protection	\$60,300	\$225	2018
2	Wakulla	Shadeville ES 1B	1989	249	Fenestration Protection	\$56,025	\$225	2018
2	Wakulla	Shadeville ES 1C	1989	249	Fenestration Protection	\$56,025	\$225	2018
2	Wakulla	Riversprings MS 1D	1999	24	Fenestration Protection	\$5,400	\$225	2018
Count								
51	Region 2 Totals:			13,654		\$3,629,373		

Table A-1.								
2020 Shelter Retrofit Report County and Regional Recommended Projects								
31-Aug-20								
Regional Planning Council (RPC) #	County	Site Name/Bldg ID	Year Built	Spaces to be Added	Project Description	SRR Project Estimate	Cost per Space	Origin SRR Year
Region 3 - North Central Florida								
3	Alachua	Southwest Rec Center	1997	1835	Fenestration Protection	\$334,035	\$182	2019
3	Alachua	W.S. Talbot ES 4 CR	2005	379	Fenestration Protection	\$50,400	\$133	2014
3	Alachua	Grace Marketplace Center 11 Dorm	2011	252	Fenestration Protection	\$55,440	\$220	2017
3	Alachua	H. Bishop MS 31 CR	2004	186	Fenestration Protection	\$32,550	\$175	2016
3	Alachua	W.T. Loften SHS 24 Cafeteria / CR	2007	670	Fenestration Protection	\$300,000	\$448	2016
3	Alachua	M.K. Rawlings ES 4 Cafeteria	2006	207	Fenestration Protection	\$28,200	\$136	2014
3	Alachua	Oak View MS 6 Cafeteria / Music	1993	447	Engineering & Fenestration	\$23,200	\$52	2014
3	Alachua	Santa Fe SHS 34 CR (west)	2008	414	Fenestration Protection	\$206,850	\$500	2014
3	Alachua	Duval Early Learning Academy 4 Cafeteria	1997	225	Fenestration Protection	\$23,250	\$103	2015
3	Alachua	J. Williams ES 6 CR	1997	230	Fenestration Protection	\$62,100	\$270	2014
3	Alachua	J. Williams ES 7 Cafeteria	1999	210	Genset Protect Enclosure	\$62,100	\$296	2014
3	Alachua	W.S. Talbot ES 3 Cafeteria	1984	172	Engineering & genset	\$38,700	\$225	2014
3	Bradford	Bradford County Fairgrounds	tdb	1063	Eng and hardening	250,000	\$235	2020
3	Columbia	Fort White HS 5 Gym	1999	510	Fenestration Protection	\$136,082	\$267	2007
3	Columbia	Fort White HS 9 Cafeteria	1999	367	Fenestration Protection	\$71,932	\$196	2007
3	Columbia	Fort White MS 27 Multipurpose	2007	162	Fenestration Protection	\$87,000	\$537	2016
3	Columbia	Fort White MS 26 CR	2007	108	Fenestration Protection	\$122,808	\$1,137	2016
3	Hamilton	Hamilton County ES 28 Cafeteria	2015	2250	Fenestration Protection	\$506,250	\$225	2018
3	Hamilton	Hamilton County HS 8 Cafeteria	2003	746	Fenestration Protection	\$167,850	\$225	2018
3	Taylor	Taylor County ES 3 CR	2002	672	Fenestration Protection	\$147,840	\$220	2017
3	Taylor	Taylor County ES 6 CR	2002	571	Fenestration Protection	\$125,620	\$220	2017
3	Taylor	Taylor County ES 5 CR	2002	341	Fenestration Protection	\$75,020	\$220	2017
3	Taylor	Taylor County ES 4 CR	2002	292	Fenestration Protection	\$64,240	\$220	2017
Count								
23	Region 3 Totals:			12,309		\$2,971,467		
Region 4 - Northeast Florida								
4	Clay	Rideout ES Caf	2003	285	Fenestration Protection	\$160,000	\$561	2016
4	Duval	Don Brewer ES 1D CR	2001	801	Fenestration Protection	\$76,950	\$225	2018
4	Duval	Kernan Trail ES 1D CR	2002	839	Fenestration Protection	\$80,700	\$225	2018
4	Duval	Oceanway ES 1D CR	2001	827	Fenestration Protection	\$180,225	\$225	2018
4	Duval	Bartram Springs ES 1A CR	2009	374	Fenestration Protection	\$30,150	\$225	2018
4	Duval	Bartram Springs ES 1B CR	2009	455	Fenestration Protection	\$101,025	\$225	2018
4	Duval	Waterleaf ES 1B CR	2011	449	Fenestration Protection	\$79,875	\$225	2018
4	Flagler	L.E.Wadsworth ES 6 CR / Cafeteria	2007	1464	Fenestration Protection	\$133,100	\$91	2017
4	Flagler	Belle Terre ES 3 CR	2004	464	Fenestration Protection	\$104,400	\$225	2018
4	Flagler	Belle Terre ES 6 CR	2004	438	Fenestration Protection	\$98,550	\$225	2018
4	Flagler	Belle Terre ES 4 CR	2004	298	Fenestration Protection	\$67,050	\$225	2018
4	Flagler	Belle Terre ES 7 CR	2004	201	Fenestration Protection	\$45,225	\$225	2018
4	Flagler	Flagler Humane Society	2000	100	Fenestration Protection	\$80,000	\$800	2019

Table A-1.								
2020 Shelter Retrofit Report County and Regional Recommended Projects								
31-Aug-20								
Regional Planning Council (RPC) #	County	Site Name/Bldg ID	Year Built	Spaces to be Added	Project Description	SRR Project Estimate	Cost per Space	Origin SRR Year
Region 4 - Northeast Florida								
4	Nassau	Wildlight ES 3	2016	386	Fenestration Protection	\$86,850	\$225	2018
4	Nassau	Wildlight ES 4	2016	351	Fenestration Protection	\$78,975	\$225	2018
4	Nassau	Wildlight ES 5	2016	393	Fenestration Protection	\$88,425	\$225	2018
4	Nassau	Wildlight ES 6	2016	359	Fenestration Protection	\$80,775	\$225	2018
4	Nassau	Yulee HS 4 Gym	2005	350	Fenestration Protection	\$77,000	\$220	2017
4	Nassau	Yulee HS 6 Cafeteria	2005	350	Fenestration Protection	\$77,000	\$220	2017
4	Nassau	Callahan IS 7 CR	2009	190	Fenestration Protection	\$32,400	\$171	2017
4	Nassau	Yulee PS 10 CR	2009	190	Fenestration Protection	\$43,200	\$227	2017
4	Nassau	Bryceville ES 2 CR	2005	177	Fenestration Protection	\$36,000	\$203	2017
4	Nassau	Bryceville ES 7 CR	2007	167	Fenestration Protection	\$36,000	\$216	2017
4	Nassau	Callahan IS 1 Cafeteria (1993 Addition)	1993	266	Fenestration Protection	\$43,200	\$162	2017
4	Nassau	Callahan IS 3 CR	1999	215	Fenestration Protection	\$45,450	\$211	2017
4	Nassau	Callahan IS 4 CR	1999	265	Fenestration Protection	\$43,200	\$163	2017
4	Nassau	Callahan IS 5 CR	1999	263	Fenestration Protection	\$43,200	\$164	2017
4	Nassau	Callahan IS 6 CR	1999	194	Fenestration Protection	\$43,200	\$223	2017
Count								
28	Region 4 Totals:			11,111		\$2,092,125		
Region 5 - East Central Florida								
5	Lake	Pine Ridge ES 4 Cafeteria	2002	213	Fenestration Protection and	\$47,925	\$225	2018
5	Lake	Round Lake ES 4 Caf	2000	210	Fenestration Protection and	\$47,250	\$225	2018
5	Lake	Lake Minneola HS Caf	2010	327	Fenestration Protection	\$80,115	\$245	2018
5	Lake	Lake Minneola HS Gym	2010	415	Fenestration Protection	\$93,375	\$225	2018
5	Lake	South Lake SHS 15 Cafeteria	2004	400	Genset	\$167,850	\$420	2017
5	Marion	Saddlewood ES 4 CR	2010	295	Fenestration Protection	\$16,000	\$54	2019
5	Orange	Meadowbrook MS 6 CR	2005	532	Fenestration Protection	\$61,576	\$116	2009
5	Orange	Meadowbrook MS 7 CR	2005	528	Fenestration Protection	\$61,534	\$117	2009
5	Orange	Wekiva HS 4 CR	2007	807	Fenestration Protection	\$178,836	\$222	2009
5	Orange	Wekiva HS 8 Aud/CR	2007	776	Fenestration Protection	\$108,121	\$139	2009
5	Orange	West Orange HS 4 CR	2008	710	Fenestration Protection	\$176,229	\$248	2009
5	Orange	West Orange HS 5 CR	2008	1,628	Fenestration Protection	\$247,726	\$152	2009
5	Orange	West Orange HS 6 CR	2008	792	Fenestration Protection	\$170,537	\$215	2009
5	Orange	West Orange HS 8 Aud/CR	2008	777	Fenestration Protection	\$127,198	\$164	2009
5	Orange	Avalon MS 2 CR	2006	335	Fenestration Protection	\$47,464	\$142	2009
5	Orange	Avalon MS 6 CR	2006	425	Fenestration Protection	\$60,595	\$143	2009
5	Orange	Avalon MS 7 CR	2006	491	Fenestration Protection	\$60,922	\$124	2009
5	Orange	Avalon MS 8 CR	2006	433	Fenestration Protection	\$60,868	\$141	2009
5	Orange	Legacy MS 2 CR	2005	345	Fenestration Protection	\$47,481	\$138	2009
5	Orange	Legacy MS 6 CR	2005	466	Fenestration Protection	\$60,681	\$130	2009
5	Orange	Legacy MS 7 CR	2005	489	Fenestration Protection	\$60,921	\$125	2009
5	Orange	Legacy MS 8 CR	2005	430	Fenestration Protection	\$60,598	\$141	2009

Table A-1.								
2020 Shelter Retrofit Report County and Regional Recommended Projects								
31-Aug-20								
Regional Planning Council (RPC) #	County	Site Name/Bldg ID	Year Built	Spaces to be Added	Project Description	SRR Project Estimate	Cost per Space	Origin SRR Year
Region 5 - East Central Florida								
5	Orange	Meadowbrook MS 8 CR	2005	470	Fenestration Protection	\$60,681	\$129	2009
5	Orange	Discovery MS 2 CR	1996	726	Fenestration Protection	\$138,460	\$191	2009
5	Orange	Discovery MS 3 CR	1996	764	Fenestration Protection	\$138,631	\$181	2009
5	Orange	Discovery MS 7 Gym	1996	618	Fenestration Protection	\$60,871	\$98	2009
5	Orange	Hunters Creek MS 3 CR	1993	681	Fenestration Protection	\$138,651	\$204	2009
5	Orange	Hunters Creek MS 7 Gym	1993	641	Fenestration Protection	\$61,851	\$96	2009
5	Orange	Meadow Woods MS 2 CR	1997	726	Fenestration Protection	\$164,989	\$227	2009
5	Orange	Meadow Woods MS 7 Gym	1997	501	Fenestration Protection	\$61,142	\$122	2009
5	Orange	Discovery MS 8 Cafeteria	1996	382	Fenestration Protection	\$50,996	\$133	2009
5	Orange	Meadow Woods MS 8 Cafeteria	1997	307	Fenestration Protection	\$46,674	\$152	2009
5	Orange	Discovery MS 6 CR	1996	274	Fenestration Protection	\$41,633	\$152	2009
5	Orange	Hunters Creek MS 6 CR	1993	234	Fenestration Protection	\$40,889	\$175	2009
5	Orange	Hunters Creek MS 8 Cafeteria	1993	289	Fenestration Protection	\$45,151	\$156	2009
5	Orange	Meadow Woods MS 6 CR	1997	237	Fenestration Protection	\$41,487	\$175	2009
5	Osceola	Chestnut ES 1 Cafeteria	2005	322	Fenestration Protection	\$72,450	\$225	2018
5	Osceola	Kenansville Community Center	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	Holopaw Community Center	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	Marydia Community Center	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	Robert Guevara Community Center	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	Buenaventura Lakes Library	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	Hart Memorial Library	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	Kenansville Library	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	Poinciana Library	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	St. Cloud Library	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	West Osceola Library	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	Kissimmee Civic Center	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Osceola	Osceola Heritage Park Center	TBD	100	Fenestration Protection	\$100,000	\$1,000	2019
5	Seminole	Chiles MS 5 Gym	2004	796	Fenestration Protection	\$40,000	\$50	2019
5	Seminole	Oviedo SHS 7 Gym	2007	799	Fenestration Protection	\$175,780	\$220	2015
5	Sumter	South Sumter SHS 38 CR	2002	352	Fenestration Protection	\$66,150	\$188	2013
5	Sumter	South Sumter MS	2000	332	Fenestration Protection	\$68,850	\$208	2013
5	Sumter	South Sumter MS 24 CR	1999	332	Fenestration Protection	\$68,850	\$208	2013
5	Sumter	Wildwood MS/HS 29 CR	1999	318	Fenestration Protection	\$68,850	\$217	2013
5	Sumter	Webster ES Caf 2011 build	2011	231	Genset	\$72,900	\$316	2020

Table A-1.								
2020 Shelter Retrofit Report County and Regional Recommended Projects								
31-Aug-20								
Regional Planning Council (RPC) #	County	Site Name/Bldg ID	Year Built	Spaces to be Added	Project Description	SRR Project Estimate	Cost per Space	Origin SRR Year
Region 5 - East Central Florida								
5	Volusia	Deland SHS 1 Aud	2003	639	Fenestration Protection	\$143,775	\$225	2018
5	Volusia	Deland HS 14 CR	2003	585	Fenestration Protection	\$131,625	\$225	2018
5	Volusia	Deland HS 15 CR	2003	592	Fenestration Protection	\$133,200	\$225	2018
5	Volusia	Mainland SHS 2B CR	2006	1,341	Fenestration Protection	\$301,725	\$225	2018
5	Volusia	Deland HS 5 Cafeteria	2003	391	Fenestration Protection	\$87,975	\$225	2018
5	Volusia	Southwestern MS 5A Gym	2006	385	Fenestration Protection	\$86,625	\$225	2018
5	Volusia	Deland HS 17 CR	1999	614	Fenestration Protection	\$138,150	\$225	2018
5	Volusia	Deland HS 2 Gym	1999	773	Fenestration Protection	\$173,925	\$225	2018
5	Volusia	Mainland SHS 3 Gym	2006	244	Fenestration Protection	\$54,900	\$225	2018
5	Volusia	Daytona Beach CC-Deland 8 CR	2002	130	Fenestration Protection	\$29,250	\$225	2018
5	Volusia	Mainland SHS 5 CR	2006	129	Fenestration Protection	\$29,025	\$225	2018
5	Volusia	Pride ES	2007	445	Fenestration Protection	\$104,575	\$235	2020
5	Volusia	Mainland SHS 2A Cafeteria	2006	0	Fenestration Protection	\$173,400	\$225	2018
Count								
69	Region 5 Totals:			29,624		\$6,557,888		
Region 6 - Central Florida								
6	DeSoto	DeSoto SHS 1C Cafeteria	1977/2010	511	Fenestration Protection	\$114,750	\$225	2019
6	DeSoto	DeSoto SHS 1F Gym	1977/2010	511	Fenestration Protection	\$114,750	\$225	2019
6	DeSoto	Nocatee ES 8 CR	2008	148	Fenestration Protection	\$33,300	\$225	2019
6	DeSoto	West ES 8 CR	2008	148	Fenestration Protection	\$33,300	\$225	2019
6	DeSoto	South Florida State College 3 CR	2003	41	Fenestration Protection	\$9,225	\$225	2019
6	DeSoto	Nocatee ES 4 CR	1999	275	Fenestration Protection	\$61,875	\$225	2019
6	DeSoto	DeSoto County Library	1997/2008	120	Fenestration Protection	\$100,000	\$833	2019
6	DeSoto	Memorial ES 15 CR	1999	105	Fenestration Protection	\$23,625	\$225	2018
6	Hardee	Zolfo ES 10 CR (3rd Grade)	2001	0	Engineering	\$20,000	\$225	2014
6	Hardee	Zolfo ES 9 Media	1994	0	Engineering	\$20,000	\$225	2014
6	Hardee	Wauchula ES 5 ESE CR	1998	111	Fenestration & MEP/Genset	\$54,900	\$495	2015
6	Hardee	Wauchula ES 6 Media	1998	109	Fenestration & MEP/Genset	\$160,000	\$1,468	2015
6	Highlands	MLK Jr Memorial Field Gym	2002	415	Engineering Study	\$15,000	tbd	2018
6	Highlands	Reflections Silver Lake Center	2005	75	Fenestration Protection	\$16,875	\$225	2018
6	Highlands	Avon Park ES CR3	2002	415	Fenestration Protection	\$230,000	\$554	2019
6	Highlands	Avon Park ES CR5	2002	415	Fenestration Protection	\$230,000	\$554	2019
6	Highlands	Avon Park Rec Center	2002	415	Fenestration Protection	\$230,000	\$554	2019
6	Okeechobee	Osceola MS 7 Gym	1995	1160	Fenestration Protection	\$190,000	\$164	2019
6	Polk	Polk County School Office 11	1993	173	Fenestration Protection	\$38,925	\$225	2019
6	Polk	Polk County School Office 12	1993	173	Fenestration Protection	\$38,925	\$225	2019
6	Polk	Mobile Home Activity Center Main	1999	133	Fenestration Protection	\$29,925	\$225	2019
6	Polk	Fort Meade MS / HS 17A CR	1998	191	Fenestration Protection	\$42,975	\$225	2019
6	Polk	Fort Meade MS / HS 19 CR	1998	160	Fenestration Protection	\$36,000	\$225	2019
6	Polk	Fort Meade MS / HS 17B CR	1998	115	Fenestration Protection	\$25,875	\$225	2019
Count								
24	Region 6 Totals:			5,919		\$1,870,225		

Table A-1.								
2020 Shelter Retrofit Report County and Regional Recommended Projects								
31-Aug-20								
Regional Planning Council (RPC) #	County	Site Name/Bldg ID	Year Built	Spaces to be Added	Project Description	SRR Project Estimate	Cost per Space	Origin SRR Year
Region 7 - Tampa Bay								
7	Citrus	Central Ridge ES 1 East Wing/CR	2006	733	Fenestration Protection	\$115,768	\$158	2016
7	Citrus	Central Ridge ES 1 Main	2006	125	Fenestration Protection	\$44,232	\$354	2016
7	Hernando	Suncoast ES 8 CR	2010	552	Engineering & Fenestration	\$115,476	\$209	2019
7	Hernando	Nature Coast Tech HS 2 CR	2001	261	Engineering & Fenestration	\$72,540	\$278	2019
7	Hernando	Chocachatti ES 6 CR	2005	241	Engineering & Fenestration	\$33,113	\$137	2019
7	Hernando	Hernando SHS 30 CR	2008	230	Engineering & Fenestration	\$113,250	\$492	2019
7	Hernando	Chocachatti ES 3 Cafeteria	1998	240	Engineering & Fenestration	\$33,113	\$138	2019
7	Hernando	West Hernando MS 6 Cafeteria	1993	226	Engineering & Fenestration	\$43,200	\$191	2019
7	Manatee	Annie Williams ES 1 CR	2007	934	Fenestration Protection	\$80,700	\$86	2007
7	Manatee	Gullett ES 1 CR/Clinic 2nd Floor	2007	934	Fenestration Protection	\$80,700	\$86	2007
7	Manatee	Lee MS 1G CR	2000	391	Fenestration & genset	\$12,629	\$32	2015
7	Manatee	Lakewood Ranch SHS 2B Aud	1996	543	Engineering & Fenestration	\$3,500	\$6	2000
7	Manatee	Lakewood Ranch SHS 3 Cafeteria	1996	466	Eng & Fenestration & genset	\$134,676	\$289	2000
7	Manatee	Lakewood Ranch SHS 2A Band	1996	306	Engineering & Fenestration	\$117,358	\$384	2000
7	Pasco	Wiregrass Ranch SHS 7 Cafeteria	2006	350	Harden exterior doors	\$10,000	\$29	2017
7	Pasco	Wesley Chapel SHS 7 Gym	1998	865	Fenestration Protection	\$194,625	\$225	2019
7	Pasco	Wesley Chapel SHS 8 Aud	1998	3184	Fenestration Protection	\$716,400	\$225	2019
7	Pasco	Connerton ES 1 Admin / Media	2010	125	Fenestration Protection	\$28,125	\$225	2018
7	Pasco	Connerton ES 2 CR	2010	125	Fenestration Protection	\$28,125	\$225	2018
7	Pasco	Double Branch ES 1 Admin	2007	125	Fenestration Protection	\$28,125	\$225	2018
7	Pasco	Double Branch ES 3 Cafeteria	2007	125	Fenestration Protection	\$28,125	\$225	2018
7	Pasco	Double Branch ES 2 CR	2007	125	Fenestration Protection	\$28,125	\$225	2018
7	Pasco	Double Branch ES 4 CR	2007	125	Fenestration Protection	\$28,125	\$225	2018
7	Pasco	Wesley Chapel SHS 5 Cafeteria	1998	350	Harden exterior doors	\$10,000	\$29	2017
7	Pasco	Cypress M/HS 1 - Admin	2017	294	Fenestration Protection	\$151,275	\$295	2020
7	Pasco	Cypress M/HS2 - Gym	2017	679	Fenestration Protection	\$151,275	\$190	2020
7	Pasco	Cypress M/HS5 - Cafeteria	2017	547	Fenestration Protection	\$151,275	\$104	2020
7	Pasco	Longleaf ES 1-Media CR	2005	289	Fenestration Protection	\$150,375	\$373	2020
7	Pasco	Longleaf ES 2- Admin & ESE	2005	119	Fenestration Protection	\$150,375	\$519	2020
7	Pasco	Longleaf ES 3 Multipurpose Dining	2005	185	Fenestration Protection	\$150,375	\$145	2020
7	Pasco	New River ES 1 - CR	2007	110	Fenestration Protection	\$150,525	\$535	2020
7	Pasco	New River ES 2-Media Room & CR	2007	367	Fenestration Protection	\$150,525	\$219	2020
7	Pasco	New River ES 3 Dining	2007	184	Fenestration Protection	\$150,525	\$244	2020
7	Pasco	Oakslead ES 1 -ESE CR	2006	295	Fenestration Protection	\$150,450	\$273	2020
7	Pasco	Oakslead ES 2-Admin & CR	2006	111	Fenestration Protection	\$150,450	\$291	2020
7	Pasco	Oakslead ES 3 - Multipurpose	2006	184	Fenestration Protection	\$150,450	\$244	2020
7	Pasco	Trinity Oaks ES 1 CR	2001	201	Fenestration Protection	\$150,075	\$438	2020
7	Pasco	Trinity Oaks ES 2 Admin & art	2001	122	Fenestration Protection	\$150,075	\$349	2020
7	Pasco	Trinity Oaks ES 3 CR	2001	197	Fenestration Protection	\$150,075	\$188	2020

Table A-1.								
2020 Shelter Retrofit Report County and Regional Recommended Projects								
31-Aug-20								
Regional Planning Council (RPC) #	County	Site Name/Bldg ID	Year Built	Spaces to be Added	Project Description	SRR Project Estimate	Cost per Space	Origin SRR Year
Region 7 - Tampa Bay								
7	Pinellas	McMullen Boothe ES 4 CR	1996	455	Fenestration Protection	\$106,925	\$235	2020
7	Pinellas	McMullen Boothe ES 45CR	1996	455	Fenestration Protection	\$106,925	\$235	2020
7	Pinellas	Fairmount ES 6 CR	2001	476	Fenestration Protection	\$111,860	\$235	2020
7	Pinellas	Palm Harbor Activity Center	1999	257	Fenestration Protection	\$89,260	\$349	2020
7	Pinellas	UPARC Long Center	1988	420	Fenestration Protection	\$210,000	\$500	2019
Count								
44	Region 7 Totals:			17,628		\$4,983,100		
Region 8 - Southwest Florida								
8	Charlotte	Charlotte County Airport Baggage	TBD	800	Fenestration Protection	\$180,000	\$225	2019
8	Charlotte	Charlotte Preparatory School	TBD	250	Fenestration Protection	\$81,250	\$325	2019
8	Glades	Glades County Health Dept 1 Main	2011	235	Fenestration Protection	\$52,875	\$225	2018
8	Lee	Veteran's Park Academy 3 Caf	2003	2763	GenSet Protection	\$265,000	\$96	2019
8	Lee	Veteran's Park Academy 9 Caf	2003	990	Fenestration Protection	\$222,750	\$225	2018
8	Lee	East Lee County HS Multipurpose	2005	250	Fenestration Protection	\$58,240	\$233	2017
8	Lee	East Lee County HS 1 Aud	2005	200	Fenestration Protection	\$44,000	\$220	2017
8	Lee	East Lee County HS 1 CR	2005	200	Fenestration Protection	\$0	\$0	2017
8	Lee	East Lee County HS 1 Cafeteria	2005	200	Fenestration Protection	\$44,000	\$220	2017
8	Lee	Sunshine ES 5 CR	2006	212	Fenestration Protection	\$47,700	\$225	2018
8	Lee	Varsity Lakes MS 2 Cafeteria / Art	2003	200	Fenestration Protection	\$45,000	\$225	2018
8	Sarasota	Gulf Gate ES	2007	2926	Fenestration Protection	\$49,580	\$169	2019
8	Sarasota	SCF - Lakewood Ranch	2011	450	Fenestration Protection	\$157,500	\$350	2019
8	Sarasota	Woodland MS	2007	256	Fenestration Protection	\$57,600	\$225	2019
8	Sarasota	Fruitville ES 10 Clrm	2015	144	Fenestration Protection	\$32,400	\$225	2019
Count								
15	Region 8 Totals:			10,076		\$1,337,895		
Region 9 - Treasure Coast								
9	Indian River	Liberty Magnet 1 Main	2005	184	Fenestration Protection	\$40,800	\$222	2017
9	Martin	Indiantown MS 5 Cafeteria	2010	600	GenSet	\$80,000	\$133	2017
9	Martin	Port Salerno ES 1 Main	2002	1,300	GenSet	\$160,000	\$123	2017
9	Martin	Indiantown MS 2 CR	1999	600	GenSet	\$80,000	\$133	2017
9	Martin	Warfield ES 8 Cafeteria	2006	231	Common Space Protection	\$51,975	\$225	2018
9	Martin	Cassidy Rec Center	2003	150	Fenestration Protection	\$33,750	\$225	2018
9	Palm Beach	FAU - Business	2004	500	Fenestration Protection	\$111,500	\$223	2007
9	St. Lucie	Dannn McCarty MS 20 CR	2001	882	Fenestration Protection	\$230,000	\$261	2019
Count								
8	Region 9 Totals:			4,447		\$788,025		

Table A-1.								
2020 Shelter Retrofit Report County and Regional Recommended Projects								
31-Aug-20								
Regional Planning Council (RPC) #	County	Site Name/Bldg ID	Year Built	Spaces to be Added	Project Description	SRR Project Estimate	Cost per Space	Origin SRR Year
Region 10 - South Florida								
10	Broward	Floranada ES a	1999	900	Fenestration Protection	\$385,000	\$427	2016
10	Broward	Floranada ES b	1999	900	Fenestration Protection	\$385,000	\$427	2016
10	Miami-Dade	Stoneman Douglas ES 10 CR	1990	324	Fenestration Protection	\$72,900	\$225	2018
10	Miami- Dade	Stoneman Douglas ES 3 CR	1990	171	Fenestration Protection	\$38,475	\$225	2018
10	Miami- Dade	Stoneman Douglas ES 1/2 CR	1990	51	Fenestration Protection	\$11,475	\$225	2018
10	Miami-Dade	Stoneman Douglas ES 7/8	1990	101	Fenestration Protection	\$22,725	\$225	2018
10	Miami-Dade	Stoneman Douglas ES 9 CR	1990	136	Fenestration Protection	\$30,600	\$225	2018
10	Miami- Dade	Stoneman Douglas ES 4 CR	1990	49	Fenestration Protection	\$11,025	\$225	2018
10	Miami-Dade	Stoneman Douglas ES 8 ESE	1990	28	Fenestration Protection	\$6,300	\$225	2018
Count								
9	Region 10 Totals:			2,660		\$963,500		
287				114,226		\$27,068,133		

Appendix B
Hurricane Evacuation Shelter Deficit Reduction Progress 2019-2020,
Post-1995 Capacity Success Stories

Table B-1. Hurricane Evacuation Shelter Deficit Reduction Progress 2019-2020 Post-1995 Capacity Success Stories								
Regional Planning Council	Is the Region in Deficit?	County	1995–8/2020 Retrofit & As-Is Current Inventory, spaces	Cumulative New School EHPA Capacity, spaces	Total Hurricane Evacuation Shelter Capacity 08/31/2020, spaces	Retrofit Capacity Under Contract, spaces	Maximum Demand (Gen pop and SpNS), spaces	2020 Is this County in Deficit?
3	No	Alachua	12,672	1,572	14,244	1,835	12,464	No
4	No	Baker	1,562	1,829	3,391	0	2,697	No
1	No	Bay	10,198	984	11,182	2,422	8,155	No
3	No	Bradford	1,303	0	1,303	0	1,454	Yes
5	No	Brevard	41,340	11,668	53,008	0	33,559	No
10	No	Broward	0	69,898	69,898	0	29,576	No
2	No	Calhoun	2,183	1,194	3,377	0	1,110	No
8	Yes	Charlotte	0	0	0	0	13,366	Yes
7	Yes	Citrus	4,706	1,276	5,982	0	13,383	Yes
4	No	Clay	6,657	3,925	10,582	2,566	11,531	Yes
8	Yes	Collier	5,453	0	5,453	0	31,975	Yes
3	No	Columbia	1,716	3,298	5,014	0	4,711	No
6	Yes	Desoto	2,874	0	2,874	1,061	3,279	Yes
3	No	Dixie	4,218	0	4,218	0	1,974	No
4	No	Duval	24,184	12,069	36,253	0	44,002	Yes
1	No	Escambia	26,367	1,656	28,023	0	11,180	No
4	No	Flagler	13,294	1,483	14,777	0	9,090	No
2	No	Franklin	0	0	0	0	533	Yes
2	No	Gadsden	2,183	3,672	5,855	0	3,904	No
3	No	Gilchrist	3,050	0	3,050	0	1,176	No
8	Yes	Glades	1,863	332	2,195	0	1,613	No
2	No	Gulf	232	186	418	0	547	Yes
3	No	Hamilton	578	1,353	1,931	0	1,114	No
6	Yes	Hardee	415	3,894	4,309	103	2,203	No
8	Yes	Hendry	4,065	0	4,065	0	3,489	No

Table B-1. Hurricane Evacuation Shelter Deficit Reduction Progress 2019-2020 Post-1995 Capacity Success Stories								
Regional Planning Council	Is the Region in Deficit?	County	1995–8/2020 Retrofit & As-Is Current Inventory, spaces	Cumulative New School EHPA Capacity, spaces	Total Hurricane Evacuation Shelter Capacity 08/31/2020, spaces	Retrofit Capacity Under Contract, spaces	Maximum Demand (General Population and SpNS), spaces	2020 Is this County in Deficit?
7	Yes	Hernando	1,193	3,044	4,237	0	11,827	Yes
6	Yes	Highlands	4,660	2,958	7,618	0	11,838	Yes
7	Yes	Hillsborough	32,960	47,996	80,956	0	55,243	No
1	No	Holmes	793	2,847	3,640	0	1,112	No
9	No	Indian River	15,000	0	15,000	0	6,306	No
2	No	Jackson	499	3,395	3,894	0	1,900	No
2	No	Jefferson	0	689	689	1,529	824	Yes
3	No	Lafayette	559	0	559	0	622	Yes
5	No	Lake	4,624	20,160	24,784	7,507	25,789	Yes
8	Yes	Lee	15,263	0	15,263	9,307	74,695	Yes
2	No	Leon	20,024	1,223	21,247	0	4,587	No
3	No	Levy	4,638	354	4,992	0	4,203	No
2	No	Liberty	1,089	620	1,709	0	532	No
3	No	Madison	3,693	0	3,693	0	1,270	No
7	Yes	Manatee	11,344	5,646	16,990	0	24,800	Yes
3	No	Marion	4,402	8,116	12,518	11,274	19,166	Yes
9	No	Martin	9,482	12,464	21,946	0	5,731	No
10	No	Miami-Dade	69,614	9,106	78,720	0	100,572	Yes
10	No	Monroe	602	0	602	0	3,051	Yes
4	No	Nassau	285	3,456	3,741	0	5,526	Yes

Table B-1. Hurricane Evacuation Shelter Deficit Reduction Progress 2019-2020 Post-1995 Capacity Success Stories								
Regional Planning Council	Is the Region in Deficit?	County	1995–8/2020 Retrofit & As-Is Current Inventory, spaces	Cumulative New School EHPA Capacity, spaces	Total Hurricane Evacuation Shelter Capacity 08/31/2020, spaces	Retrofit Capacity Under Contract, spaces	Maximum Demand (General Population and SpNS), spaces	2020 Is this County in Deficit?
1	No	Okaloosa	10,122	0	10,122	0	6,027	No
6	Yes	Okeechobee	1,176	946	2,122	300	7,979	Yes
5	No	Orange	9,068	27,959	37,027	5,650	30,382	No
5	No	Osceola	26,326	11,615	37,941	0	10,811	No
9	No	Palm Beach	0	82,458	82,458	0	31,014	No
7	Yes	Pasco	14,702	15,573	30,275	0	32,260	Yes
7	Yes	Pinellas	22,817	8,595	31,412	0	46,178	Yes
6	Yes	Polk	5,497	35,073	40,570	4763	45,503	Yes
4	No	Putnam	3,116	791	3,907	0	4,848	Yes
4	No	Saint Johns	25,375	3,022	28,397	0	13,507	No
9	No	Saint Lucie	25,475	531	26,006	0	8,483	No
1	No	Santa Rosa	6,909	6,442	13,351	0	6,025	No
8	Yes	Sarasota	8,010	7,619	15,629	7,748	31,726	Yes
5	No	Seminole	29,138	3,291	32,429	3,342	12,195	No
5	No	Sumter	1,718	402	2,120	0	9,886	Yes
3	No	Suwannee	1,044	3,810	4,854	0	3,964	No
3	No	Taylor	6,654	0	6,654	0	1,776	No
3	No	Union	1,736	0	1,736	0	751	No
5	No	Volusia	15,416	7,389	22,805	0	40,122	Yes
2	No	Wakulla	335	88	423	0	944	Yes
1	No	Walton	4,289	5,489	9,778	0	1,957	No
1	No	Washington	5,136	1,211	6,347	0	1,696	No
Subtotals:			596,058	464,709	1,060,767		955,713	
Grand Totals:			1,060,767			59,407		

Appendix C

Methodology for Prioritizing Projects for Funding

The Division has developed a point-based priority ranking methodology to evaluate recommended projects. The methodology is consistent with Section 252.385, F.S., and the Division's hurricane evacuation shelter survey guidelines. Factors that were considered in the retrofit proposal review process were regional and local (county) hurricane evacuation shelter space deficit; facility design, construction and location considerations; proposed hurricane evacuation shelter type (general population, special/medical needs, or pet-friendly); maximize use of State funds/cost-effectiveness; ownership and shelter use availability of the facility; etc. See Appendix D for an example of the 2020 Project Priority Worksheet. The factors considered for priority ranking this year are generally consistent with those used in previous *Shelter Retrofit Reports* (SRR). Three exceptions are noted: 1) additional emphasis has been placed on special/medical needs shelters (SpNS); 2) additional points for counties lacking adequate pet sheltering facilities and 3) additional emphasis on retrofitting facilities designed and constructed to the most recent building codes and standards. Projects carried over from the 2019 SRR were reevaluated on changes in the shelter deficits (region and/or county, if any), and on additional information provided in updates from the counties.

The hurricane evacuation shelter space deficit information used for this report was published in the 2020 SESP. The 2020 SESP determined that seven out of ten regions had no hurricane evacuation shelter space deficits; the exceptions being Central Florida (RPC 6), Tampa Bay (RPC 7), and Southwest Florida (RPC 8). However, even though there may be sufficient cumulative capacity within regions, many individual counties still have deficits. The 2020 SESP determined that only four regions of the State have adequate special needs spaces. The remaining six regions have deficits. Therefore, scoring items are necessary for both regional and county SpNS deficits.

The combined maximum score of all four shelter space deficit-based items is 400 of a total maximum of 715 points.

In prioritizing projects, the Division based its ranking scores on the criteria described below. If the desired information in a given line item was not provided, and could not be readily determined from other sources, no points were allocated, except as otherwise noted. In some cases, certain criteria were considered no go and the facility excluded from recommendation. The no go designation was only given when a condition existed that could potentially exclude the building as a shelter, such as the presence of uncertified long span roof, unreinforced masonry walls or storm surge flooding. The following is a listing of the specific criteria used by Division staff to rank each project based upon information provided with each project proposal.

Proposed project is located within an RPC Region with a deficit of General Population Hurricane Evacuation Risk Shelter Space (Maximum of 100 points):

Section 252.385(3), F.S., directs that priority be given to regions of the State where shelter deficits are greatest. Regional hurricane evacuation shelter space deficit data was provided by the 2018 SESP. A maximum of 100 points was given for those facilities that are located in regions with the

most severe shelter space deficits (< 14.9 sf of floor space per evacuee). Lesser points were given to retrofit projects in regions with less severe deficits.

Proposed project is located within a County with a deficit of General Population Hurricane Evacuation Risk Shelter Space (Maximum of 100 points):

Though regions are the highest priority in ranking, evacuations are generally local with emergency managers recommending that evacuees travel tens of miles instead of hundreds. County hurricane evacuation shelter space deficit data was provided by the 2018 SESP. A maximum of 100 points was given for those facilities that are located in a county with a severe shelter space deficit (<14.9 sf of floor space per evacuee). Lesser points were given to retrofit projects in counties with less severe deficits.

Proposed project is located within an RPC Region with a deficit of Special/ Medical Needs Shelter (SpNS) Hurricane Evacuation Risk Shelter Space. (Maximum of 100 points) and or pet friendly (Maximum of 50 points):

The 2018 SESP identified that even when there may be sufficient general population shelter space, there may still be a deficit in SpNS. Therefore, this new item has been added to place priority on this type of retrofit project. Regional hurricane evacuation shelter space deficit data was provided by the 2018 SESP. A maximum of 100 points was given for those facilities that are located in regions with the most severe shelter space deficits (< 44.9 sf of floor space per person with special needs (PSN) evacuee). Lesser points were given to retrofit projects in regions with less severe deficits.

Proposed project is located within a County with a deficit of Special/Medical Needs Hurricane Evacuation Risk Shelter Space (Maximum of 100 points):

Though regions are the highest priority in ranking, evacuations are generally local with emergency managers recommending that evacuees travel tens of miles instead of hundreds. The 2018 SESP identified that even when there may be sufficient general population shelter space, there may still be a deficit in SpNS. Therefore, this new item has been added to place priority on this type of retrofit project. County hurricane evacuation SpNS space deficit data was provided by the 2018 SESP. A maximum of 100 points was given for those facilities that are located in a county with a severe SpNS space deficit (< 44.9 sf of floor space per PSN evacuee). Lesser points were given to retrofit projects in counties with less severe deficits.

Building Ownership and Availability for use as a Public Hurricane Evacuation Risk Shelter (Maximum of 50 points):

A maximum of 50 points was allocated, depending on ownership and availability status. Lesser points were given to retrofit projects that may have limitations on their public shelter availability during a disaster. Public facilities receive the highest priority based on their availability. Public facilities are generally those that are subject to inclusion in the Division's public hurricane evacuation shelter survey program. Private facilities, such as religious, civic or fraternal organizations' multi-purpose buildings, private schools, arenas, stadiums, convention or conference centers were recommended for retrofit based upon local need for public shelter space, previous history as a public shelter and/or existing written agreements and endorsement by the local

emergency management director. Full availability means that, during a declared local State of emergency and upon request by local emergency management, the public shelter function will take priority over all other activities.

Numerical increase in shelter capacity due to proposed Retrofit Project. (Maximum of 75 points):

A maximum of 75 points was allocated based on numerical increase in shelter hurricane evacuation risk shelter space capacity. The maximum amount of points were given to projects creating >500 spaces. Lesser points were given to projects creating less additional spaces. No points were allocated for shelter spaces already in the inventory. This item serves to maximize use of State funds.

Cost-effectiveness of Project(s) (Maximum 50 Points):

A maximum of 50 points was allocated if the average total cost per shelter space was <\$350. If not, then zero points were allocated. A maximum of 50 points was allocated depending on the average cost per space of the proposed project; i.e., cost-effectiveness. This was based on the total proposed cost divided by the total quantity of hurricane evacuation risk shelter spaces gained. If the number of spaces, or costs, could not be determined, no points were allocated. This item serves to maximize use of State funds.

Age of Building (Maximum of 50 Points):

A maximum of 50 points were allocated if the building was built after the year 2000. If the building was built before the year 2000, then zero points were allocated.

Flood Hazard and Building Design and Construction Criteria (Maximum of 90 points):

The Division recommends that all hurricane evacuation shelters be reviewed for consistency. Critical building envelope features (exterior wall and roof construction, percentage of glass in exterior walls, long span roof, etc.), year built to determine design wind code requirements, presence of interior core area or storm room, and other construction factors must be included in the decision to utilize the building as a hurricane evacuation shelter and establish its priority for retrofitting. There is only nominal value to installing window protection systems on a shelter building if there are other “weak links” that are limiting factors for the building’s hurricane performance. Storm surge and rainfall are also important factors when reviewing and prioritizing a building as a potential hurricane evacuation shelter.

A maximum of 90 points were allocated based on how well the given facility is demonstrated to conform to guidelines after completion of the proposed retrofit. These criteria are used to maximize the hurricane safety provided by a specific retrofit project.

- A. A maximum of 30 points was allocated based on what Sea, Lake and Overland Surges from Hurricanes (SLOSH) or Storm Surge evacuation zone the facility is in. Presence of the facility in a Category 1/Tropical Storm or Category 2 surge zone is a no go and excludes the project from recommendation. The point system used for this item is generally consistent with Section 1013.372(1), F.S., that exempts educational facilities from the public shelter design criteria if located within a Category 1, 2, or 3 Evacuation Zone.

- B. A maximum of 30 points was allocated based on the National Flood Insurance Program (NFIP) Flood Insurance Rate Map (FIRM) flood zone (as established in the most recently published FIRM). If this information was not provided, no points were allocated. Generally, buildings in FIRM zones with an “A” designation received very limited or no points. Recommendations for projects in A zone may require detailed justification. Exception was given to those counties (such as Miami-Dade and Collier) whose populations live in areas that are extremely flat and provide very limited natural drainage.
- C. A maximum of 30 points was allocated based on the building construction parameters. Here the building’s structural and envelope characteristics are very important. Structures are evaluated to shelter people during a severe windstorm or major hurricane. Typically, unreinforced masonry walls, flat lightweight roofs over uncertified long spans, pre-engineered metal buildings, lack of load-path connectors, etc. will disqualify a building from consideration. The points are also allocated based on the building’s wind design code. Building’s designed and constructed to the Florida Building Code (2003-present) are expected to perform better than those designed and constructed to older less-modern codes. Lesser points were given to retrofit projects designed and constructed to modern wind codes and standards of the 1990’s and early 2000’s. If the building’s wind code is unknown or from an edition prior to 1989 then zero points were allocated.

Appendix D

List of Acronyms and Abbreviations

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ANSI: American National Standards Institute

ARC: American Red Cross

ASCE: American Society of Civil Engineers

BFE: Base Flood Elevation

CMU: Concrete Masonry Unit

EHPA: Enhanced Hurricane Protection Area

EPZ: Emergency Planning Zone

FBC: Florida Building Code

FDOE: Florida Department of Education

FEMA: Federal Emergency Management Agency

FFE: Finished Floor Elevation

FIRM: Flood Insurance Rate Map

FY: Fiscal Year

GP: General Population

HB: House Bill

HESSS: Hurricane Evacuation Shelter Selection Standards (American Red Cross, June 2018)

HMGP: Hazard Mitigation Grant Program (federal)

ICC: International Code Council

LEPC: Local Emergency Planning Committee

LiDAR: Light Detection and Ranging

LMS: Local Mitigation Strategy

LRDM: Least-Risk Decision Making

NFIP: National Flood Insurance Program

NWS: National Weather Service

PRM: Partially Reinforced Masonry

PSN: Persons with Special Needs

RPC: Regional Planning Council

SES: Standby Electrical System

SESP: Statewide Emergency Shelter Plan

SLOSH: Sea, Lake and Overland Surges from Hurricanes

SpNS: Special Needs Shelter (also SNS)

SRES: Statewide Regional Evacuation Studies

SRR: Shelter Retrofit Report

Appendix E

Glossary

Appendix E

Glossary

Approved: Acceptable to the authority having jurisdiction.

As-Is: Current or existing condition at the time of survey or review of applicable documentation.

Barrier Island (Coastal): Geological features which lie above the line of mean high water and are completely surrounded by open marine waters that front upon the Gulf of Mexico, Atlantic Ocean, Florida Bay or Straits of Florida; reference Section 161.54(2), Florida Statutes.

Base Flood Elevation: The elevation for an area, for which there is a one percent chance in any given year that flood levels will equal or exceed it.

Brick Veneer: A facing of brick masonry that is a single Wythe in thickness (3" to 4") that is anchored or adhered to a structural backing, but not designed to carry loads other than its own weight.

Buildings: Structures, usually enclosed by walls and a roof, constructed to provide support or shelter for an intended occupancy.

Building Enclosure: Exterior cladding, roof deck, walls, window and door assemblies, skylight assemblies, and other components enclosing a building and serving as a barrier between exterior and interior environments. Also known as building envelope.

Building Envelope: See Building Enclosure.

Certify: Statement in writing by a duly licensed professional attesting to compliance with a standard. Also, Certification.

Concrete Masonry Unit: A block or brick cast of Portland cement and suitable aggregate, with or without admixtures (additives), and intended for laying up with other units, as in normal stone masonry construction.

Critical Support Systems: Structures, systems and components required to ensure the health, safety and well-being of occupants. Critical support systems include, but not limited to, life safety systems, potable and wastewater systems, electrical power systems and heating, ventilation and air-conditioning (HVAC) systems.

Enclosed: A condition where there is insufficient opening area in the exterior enclosure of a building to cause unbalanced or excessive air pressure differences (either positive or negative) between the interior and exterior of the enclosure during a windstorm event.

Enhanced Hurricane Protection Area: A new educational facility, or portion thereof, designed, constructed, inspected and maintained in accordance with the Public Shelter Design Criteria, Section, *Florida Building Code—Building* in affect at the time of permitting by the Authority Having Jurisdiction.

Essential Facilities: Facilities that are classified as Risk Category IV in Table 1.5-1 of ASCE 7-10; Buildings and other structures that are intended to remain operational in the event of an extreme environmental loading condition (e.g., wind and flood).

Evacuation Shelter: A safe congregate care facility that provides services and is utilized for populations displaced by an emergency or disaster incident. An evacuation shelter may be located either inside (risk shelter) or outside (host shelter) of the disaster impact area and are typically operational for a period to not normally exceed 72 hours. Typically, these capacities are determined based on 20 square feet per person.

Risk Shelter: Facilities designated as risk shelters may be located within the hazard risk zone (i.e., lie in the forecast path and associated error cone of an approaching hurricane or severe storm). Construction of these facilities meets established minimum safety requirements considered for least-risk decision making for the community.

Host Shelter: A facility that is safe, provides services and is located outside of a hazard risk zone.

Evacuees: Persons that have temporarily fled from flood-prone areas, manufactured housing or other high wind-vulnerable structures.

Excluded Space: Spaces such as mechanical, electrical and telecommunication equipment rooms, storage rooms, exterior/outside circulation and open corridors, restrooms and shower areas, kitchen and food preparation rooms, science rooms and labs, computer and information technology labs, vocational and industrial technology shops and labs, library and media rooms and labs, administrative office and support areas, record vaults, attics and crawl spaces. Reference Section 453.25.3.1, *Florida Building Code—Building*.

Exiting Hurricane: Hurricanes that have crossed over land and approach a coastal area from an inland direction. Storm surge effects for a given category of storm are generally less intense in an Exiting hurricane than for a landfalling hurricane.

Fenestration: Design and placement of windows, doors, louvers, vents and other assemblies that penetrate through the exterior surface of a building or structure.

General Population Shelter: Location(s) that are, in whole or in part, to provide shelter and services to persons who have no other option for sheltering. These shelters provide basics such as food, water and basic first aid. Persons evacuating to a pet friendly shelter should bring their own supplies such as pet food, pet cages/carriers, blankets, toiletries/hygiene items, medications and clothing. To the extent possible, back-up generator power may be made available.

Guideline: Criterion, process or method established to assist in determining a course of action, but not necessarily required or enforceable by law. A framework that can assist in decision-making.

Hurricane Evacuation Shelter: A building, structure, or portion(s) thereof, designated to serve as a place of relative safety during a threatening, imminent or occurring hurricane incident. Also known as Evacuation Shelter.

Included Space: All rooms and areas not listed in the definition of excluded space.

Landfalling Hurricane: Hurricanes that approach a coastal area from a seaward direction. Storm surge effects for a given category of storm are more intense in a landfalling hurricane than for an Exiting or paralleling hurricane.

Leeward: Facing away from the direction of the oncoming wind flow; projected building surfaces on the opposite side than the wind encounters causing pulling loads or negative pressures.

Loadpath: The assemblage of structural components and connections that transfer wind loads from point or area of application through to the main wind force resisting system and then to the foundation.

Long Span (Roof): See Open Span.

Marginal: Lower end of suitability; less than preferred.

Mass-Care: Emergency provision of life sustaining services to ensure the health, safety and wellbeing of a congregate or collective population, to include shelter, food and water, sanitation, first aid, security, etc.

Mitigation: Actions taken to prevent or reduce the risk to life, property, social, economic activities, and natural resources from natural or technological hazards.

New Construction: Means any construction of a building or unit of a building in which the entire work is new. An addition connected to an existing building which adds square footage to the space inventory is considered new construction. See S.423.5.8, *Florida Building Code—Building*.

Occupancy: The purpose for which a building or other structure, or part thereof, is used or intended to be used.

Occupant Support Areas: Areas required to ensure the health, safety and well-being of occupants. Occupant support areas may include, but not limited to, shelter management, food preparation, water and food storage, electrical and mechanical rooms, toilet and other sanitation rooms, and first-aid stations.

On-site: Means located either inside, immediately adjacent to, or on the same contiguous property grounds of a facility, building or place and under the control of the owner or lawful tenant.

Opening(s): Apertures or holes in a building enclosure (or envelope) which allow air to flow through into and out of a building

Partially Enclosed: A condition where sufficient opening area in the exterior enclosure of a building may cause unbalanced or excessive air pressure differences (either positive or negative) between the interior and exterior of the enclosure during a windstorm.

Person(s) with Special Needs (PSN): Someone who during periods of evacuation or emergency require sheltering assistance due to physical impairment, mental impairment, cognitive impairment, or sensory disabilities. See Rule 64-3.010(1), Florida Administrative Code.

Pet Friendly Shelter: Location(s) that are, in whole or in part, to provide shelter and services to persons with companion animals (pets) who have no other option for sheltering. These shelters may allow caregivers to remain with pets. These shelters provide basics such as food, water and basic first aid. Persons evacuating to a pet friendly shelter should bring their own supplies such as pet food, pet cages/carriers, blankets, toiletries/hygiene items, medications and clothing.

Precast Cement-Fiber Planks (PCF Planks): A common building material that is manufactured from cement and fiber (cementitious fiber) and cast into a composite panel or plank. Typical uses include roof decking and sound absorption panels on interior wall surfaces.

Pre-Engineered Metal Building (PEMB): An easily recognizable prefabricated, standardized type of light steel frame building, which is found in similar form throughout the United States. It consists of two types of steel frame systems -- transverse (short axis) moment-resistant frames, typically rigid frame bents with tapered sections, and longitudinal (long axis) braced frames. This class of building is typically one story or has only a minor mezzanine/partial second story, lightweight cladding, or stud-framed walls.

Prewiring: The modification of a facilities electrical system to simplify and expedite connection with a compatible alternate power supply or generator; also, Standby Electrical System.

Qualitative: Assessment based upon empirical methods and observed qualities and characteristics.

Recognize: Acceptance or acknowledgement of validity based upon available observations, facts, documents and certifications. Also, recognition.

Reinforced Masonry: Masonry wall construction in which steel reinforcement is integrally embedded in a manner that permits the two materials to act together in resisting forces. Reinforced masonry can generally be recognized by observing vertical reinforcement (rebar) spacing that do not exceed six times the nominal thickness (6t) of the masonry unit (this is 4 feet o.c. for 8" masonry). Partially reinforced masonry can generally be recognized by observing vertical rebar spacings greater than 6t, but less than about 10t (typically 8 feet o.c. for 8" masonry), or an acceptable alternative.

Remodeling: Means the changing of existing facilities by rearrangement of spaces and their use and includes, but is not limited to, the conversion of two classrooms to a science laboratory or the conversion of a closed plan arrangement to an open plan configuration.

Renovation: Means the rejuvenating or upgrading of existing facilities by installation or replacement of materials and equipment and includes, but is not limited to, interior or exterior reconditioning of facilities and spaces; air-conditioning, heating, or ventilating equipment; fire alarm systems; emergency lighting; electrical systems; and complete roofing or roof replacement, including replacement of membrane or structure.

Retrofit: Modification performed upon an existing structure or infrastructure with the goal of significantly reducing or eliminating potential damage due to a specific hazard.

Roof cover: The exterior weather protection membrane of a roof assembly that is intended to prevent rainwater intrusion into the interior of a building.

Safe: Affording protection that is consistent with the intent of American Red Cross publication *Hurricane Evacuation Shelter Selection Standards* (June 2018), or the former *ARC Standards for Hurricane Evacuation Shelter Selection* (June 1992 or January 2002). Also, Safer and Safest.

Saffir-Simpson Hurricane Scale: The current prevalent system of classifying hurricane intensity in the Atlantic, Caribbean and East Pacific oceans. Hurricanes are categorized on a scale of 1 (minimum) to 5 (extreme) based on wind velocity and provides examples of types of damage and impacts in the United States associated with winds of the indicated intensity.

Sea, Lake and Overland Surges from Hurricanes (SLOSH): A computerized numerical model developed by the National Weather Service to estimate storm surge heights resulting from historical, hypothetical or predicted hurricanes by taking into account atmospheric pressure, size, forward speed and track data. These parameters are used to create a model of the wind field which drives the storm surge.

Shelter: A designated place, building or facility of relative safety that temporarily provides services with the goal of preserving life and reducing human suffering.

Shelter Envelope: Vertical and horizontal materials and assemblies that enclose a shelter area and serve as protective barriers from hurricane wind and debris hazards. The shelter envelope includes roof coverings, roof assembly, roof top vent & equipment penetrations for assemblies, exterior walls, door and window assemblies, glazing, skylight assemblies, louvers and where applicable floor and interior wall assemblies that separate the shelter from unprotected areas of a host building.

Shutters: Permanent or temporary closures or shields and assemblies that serve as a structural barrier to resist wind induced loads that act on their surface(s), to include aerodynamic and wind-borne debris impact loads.

Site: The spatial location of existing or planned facility(s), ancillary structures and utilities, improvements and surrounding environment. A space of ground occupied or to be occupied by a facility or program.

Softspot: Portion(s) of a building's exterior enclosure constructed of materials that are likely to perform poorly in high winds and cause an opening, or easily penetrated by common windborne debris.

Special/Medical Needs Shelter (SpNS): Location(s) that are, in whole or in part, designated under Chapter 252 and Section 381.0303, Florida Statutes, to provide shelter and services to persons with special needs who have no other option for sheltering. These shelters are designated to have back-up generator power. Special needs shelter services are to minimize deterioration of pre-event levels of health. See Rule 64-3.010(10), Florida Administrative Code. Typically, these capacities are determined based on 60 square feet per person.

Special Needs Client(s): See Person(s) with Special Needs.

Standard: Reference, criterion or procedure that is accepted or acknowledged as being authoritative, and establishes a minimum quantitative or qualitative measure or attribute that can be required and enforceable by law.

Standby Electrical System: Electrical work designed, installed or constructed as part of a facility's emergency, locally required and optional circuits to a permanent back-up generator-set (genset) or expedite safe connection to other optional power source; includes electrical and standby emergency power systems consistent with Section 453.25.5 and subsections, *Florida Building Code—Building*.

Storm Surge: An abnormal rise in sea level accompanying a hurricane or other intense storm, and whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the storm. Storm surge is usually estimated by subtracting the normal or astronomical high tide from the observed storm tide.

Survey: A gathering and assessment of provided or available information to be used as necessary to carry out the purposes of S. 252.35(2)(p) and 252.385(2)(a), Florida Statutes. Information may include data, facts, figures, opinions, reports, studies, maps, photographs, construction drawings, specifications and observations.

Untenable: Unfit for occupancy; uninhabitable.

Windward: Facing into the direction of the oncoming wind flow; projected building surfaces that the wind encounters causing pushing loads or positive pressures.