



# Natural Disaster Component Support Document

The associated BrowardNEXT2.0 Comprehensive Plan was adopted on March 28, 2019 (Ordinance No. 2019-11) by the Board of County Commissioners.

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## List of Acronyms

CCCL	Coastal Construction Control Line
CME	Coastal Management Element
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
NDC	Natural Disaster Component
LOS	Level of Service
RESC	Regional Emergency Services & Communications

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## List of Definitions

**Coastal High Hazard Areas** – The evacuation zone for a Category 1 hurricane established in the regional hurricane evacuation study applicable to Broward County.

**Comprehensive Emergency Management Plan (CEMP)** – The CEMP addresses concepts and responsibilities of collaborated and coordinated county emergency management efforts among the many internal and external county stakeholders and Broward County Regional Emergency Services and Communications. Additionally, the CEMP describes strategies and mechanisms through which the local and county governments and agencies will mobilize resources and conduct activities to guide and support efforts for emergency operations.

**Evacuation Order Time** – The time in hours by which the evacuation order must be given to allow all evacuees to reach their destination.

- a. An evacuation order shall be issued by the County Administrator twenty-one hours prior to expected hurricane landfall for Zone A and twenty-six hours prior to hurricane eye landfall for Zone B.
- b. Evacuation operations should commence four hours after an evacuation order is issued by the County Administrator and shall be in effect 6.5 hours for Zone A and 12 hours for Zone B.

**Evacuation Routes** – Routes designated by county emergency management authorities, or the regional evacuation plan, for the movement of persons to safety, in the event of a hurricane.

**Hurricane Evacuation Zones** – The hurricane evacuation zones are areas requiring evacuation based upon the expected storm event, which are delineated in the Broward County Coastal Hurricane Evacuation Plan as follows:

**Zone A.** A storm situation that will produce a Saffir/Simpson category of 1 to 2 hurricane intensity, with a storm surge of four to seven feet above mean sea level and winds ranging from 74 to 110 miles per hour in velocity, will necessitate the evacuation of all residents, residing from the coastline to the Intracoastal Waterway as well as all county mobile homes.

**Zone B.** A storm situation that will produce a Saffir/Simpson category 3 to 5 in hurricane intensity, with a storm surge of seven to eleven feet above mean sea level and winds ranging from 111 to 155 miles per hour in velocity, will necessitate the evacuation from the coastline to U.S. 1/ Federal Highway and all mobile homes.

**Hurricane Shelter** – A structure designated by County officials as a place of safe refuge during a storm or hurricane.

**Hurricane Vulnerability Zone** – The areas (hurricane evacuation areas and mobile home parks) delineated by the regional or local evacuation plan as requiring evacuation.

**Interagency Hazard Mitigation Report** – The recommendations of a team of federal, state, regional, or local officials which address measures to reduce the potential for future flood losses and which is prepared in response to a Presidential Disaster Declaration.

**Persons with Special Needs** – Those persons with minor health/medical conditions that require: professional observation, assessment and maintenance; assistance with personal care and/or assistance with medications but do not require hospitalization; and/or needs medications and/or vital sign readings and is unable to do so without professional assistance.

**Transit Dependent** – Those persons within the Risk Area who do not have access to an automobile for evacuation during a hurricane situation.

**Tropical Storm Force Winds (TSFW)** – The TSFW is defined as one-minute sustained winds >39 mph or 34 knots. The arrival of TSFW initiates the pre-landfall hazard time during which hazardous conditions exist prior to actual storm landfall. Evacuation timing procedures should be completed before the arrival of the TSFW (Broward County CEMP, 2015).

**Vulnerable Population** – Those persons at risk during an emergency or natural disaster due to a disability, frailty or health issues and who elect to shelter in place.

## Support Document

# Natural Disaster Component

## Introduction

### A. General

Consistent with Florida Statutes Section 163.3177(g)7, the purpose of the Natural Disaster Component (NDC), as part of the Coastal Management Element (CME), is to plan to "protect human life against the effects of natural disasters." Natural disaster planning issues have been singled out as a separate component to stress their importance in Broward County. The NDC Support Document provides the data and analysis used as the basis for the goal, objectives and policies included in the NDC.

The NDC Support Documents are divided into five parts: Part I identifies the service area, the planning horizons and defines key terms. Part II addresses the data requirements and includes inventories of hurricane evacuation planning data, post-disaster redevelopment data, and coastal high hazard areas. Part III analyzes current hurricane evacuation planning issues. Part IV addresses implementation of the Natural Disaster Component. Part V lists appendices.

### B. Service Area

The NDC service area is the hurricane evacuation zone, as defined herein, and all mobile home parks in Broward County with regard to hurricane evacuation.

### C. Planning Horizon

The short-term planning horizon is 2020, while the long-term planning horizon is 2040, in accordance with the requirements of Florida Statutes Chapter 163.3177 (5)(a), which states that "each local government comprehensive plan must include at least two planning periods, one covering at least the first 5-year period occurring after the plan's adoption and one covering at least a 10-year period. Additional planning periods for specific components, elements, land use amendments, or projects shall be permissible and accepted as part of the planning process."

# Data Requirements

This Natural Disaster Component is intended to address the natural disaster issues identified in Florida Statutes Chapter 163.3178(2)(d), (e), and (f), which pertains to the Coastal Management Element.

## A. Hurricane Evacuation Planning Data

According to the National Oceanic and Atmospheric Administration (NOAA), Florida has been struck by more hurricanes than any other state in recorded history. Including Hurricane Irma in 2017, Florida has now sustained 117 direct hits by hurricanes which represents 40% of all US hurricanes. This is due to warmer water temperatures fed by the Gulf Stream and the west-northwesterly direction in which hurricanes travel. Hurricane season runs from June 1 to November 30 but planning and preparation are year-round activities.

### 1. Hurricane Vulnerability and Evacuation Zones in Broward County

The hurricane vulnerability zone includes areas requiring evacuation in the event of a 100-year storm or Category 3 storm event. The hurricane evacuation zone is that area requiring evacuation in the event of a Category 1 through 5-storm event. As the result of an elevation study conducted in the year 2000, there has been a significant reduction in the mandatory hurricane evacuation zones in Broward County. Two (2) types of evacuation zones – Zones A and B – correspond to hurricane intensity as follows:

*Zone A.* This is the area requiring evacuation in the event of a storm situation that will provide a Saffir/Simpson Category 1 and 2 hurricane intensity. This area includes all areas east of the Intracoastal Waterway, mobile home residents, residents beside tidal bodies of water and in low-lying areas.

*Zone B.* This is the area requiring evacuation in the event of a storm situation that will provide a Saffir/Simpson Category 3 through 5 hurricane intensity. This zone includes all areas east of U.S. 1/ Federal Highway, mobile home residents, residents beside tidal bodies of water and in low-lying areas.

### 2. Number of Persons Requiring Evacuation

Table ND-1 illustrates the number of persons, Countywide, requiring evacuation by hurricane intensity. According to this, about 2 percent of the County's total population is located within an evacuation zone during a Category 1 or 2 hurricane. During a hurricane with Category 3 through 5 intensities, those people requiring evacuation more than doubles to 5.4 percent of the Broward County population.

**Table ND-1:** Number of Persons Requiring Evacuation by Hurricane Intensity (Countywide)

Hurricane Intensity	Number of Persons
Category 1 and 2	44,775
Category 3 through 5	99,378

*Source: Table B01003, U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates EOC Evacuation Zones, January 18, 2018.*

According to the Florida Department of Health, there were 14,469 mobile home units in Broward County in 2017, including 114 mobile home units in the Broward Municipal Services District (BMSD). The name, location and number of mobile homes in each mobile home development is shown in the Housing Element Support Document's Appendix H-D. This number represents a decrease over the past ten years. The number of mobile homes should continue to decline as no new mobile home parks being established and several existing parks are being redeveloped for other uses including either permanent resident units or other non-residential uses.

### 3. Number of Persons Requiring Public Hurricane Shelter

The number of persons requiring public hurricane shelter includes not only those persons living within the hurricane vulnerability and evacuation zones, but also those persons residing in mobile homes and homeless people. Table ND-2 shows that, during a Category 1 or 2 hurricane, about 3.4% of Broward County's total population requires sheltering. This percentage increases to 6.4% of the population during a Category 3 through 5 strength hurricane.

**Table ND-2:** Estimated Number of Persons Requiring Public Shelters by Hurricane Intensity (Countywide)

Hurricane Intensity	Number of Persons
Category 1 and 2	64,039
Category 3 through 5	118,642

*Source: Table B01003, U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates EOC Evacuation Zones, January 18, 2018, Mobile Home Report, Broward County Health.*

### 4. Number of Hurricane Shelter Spaces Available

An inventory of hurricane shelter sites is shown in the Appendix ND-B and associated map, Appendix ND-C. There are currently 41 public schools in Broward County serving as some type of hurricane shelter. A total of 34 schools are used as basic hurricane shelters and five (5) schools are designated as special needs shelters. According to Regional Emergency Services & Communications, the general population shelters could functionally hold on average 21,000 persons, depending on square footage per person and extra staff enabling the usage of additional space, and the special needs shelters could accommodate around 1,000 persons, for a total of about 22,000 shelter spaces to serve Broward County. Additional shelter spaces would be needed if all residents within the evacuation zone and in mobile homes required sheltering. During Hurricane Irma in 2017, the County opened pet friendly shelters which did not allow animals in the same area as people, but enabled residents to ensure the safety of their pets.



## 5. Special Needs Registry

Residents with special needs who require electricity for medical needs or have a medical condition that cannot be supported at a general population shelter may pre-register for the Broward County Special Needs Emergency Sheltering and Transportation Program. This program is a cooperative effort between Broward County Regional Emergency Services and Communications, Florida Department of Health in Broward, disability advocates and local health care providers. Sheltering applications are available from Broward County Regional Emergency Services and Communications and transportation is coordinated by Broward County Paratransit or the Office of Medical Examiner and Trauma Services, depending on need.

There are three levels of shelter based on medical need:

1. Mass Care Shelter, coordinated by the American Red Cross, which requires no pre-registration;
2. Special Needs Shelter, coordinated by Florida Department of Health in Broward; and
3. Higher Level of Care Shelter, requiring boarding in participating hospital.

The Florida Department of Emergency Management and Florida Department of Health in Broward estimate that about 1,100 people are registered with the Special Needs Emergency Sheltering and Transportation Program.

## 6. Vulnerable Population Registry

Residents who are at risk due to disability, frailty or other health issues, regardless of age, and who elect to shelter at-home during an emergency or natural disaster, are eligible for the Vulnerable Population Registry. A partnership between Broward County Regional Emergency Services and Communications and the municipalities' emergency management agencies, the registry assists emergency responders in better planning for post-disaster recoveries.

## 7. Evacuation Routes

There are 23 evacuation routes in Broward County leading from and into hurricane evacuation areas. These routes and other pertinent information, such as the east-west terminus, jurisdiction and barrier island access, are displayed in Appendix ND-A. Slightly over half of these routes (52 percent) have barrier island access. Nearly all evacuation roadways – except for Copans Road, Cypress Creek Road, and Johnson Street – are at least partially under the authority of the Florida Department of Transportation (FDOT). A map of evacuation routes is available on the Broward County website on the [Evacuation Routes & Zones](#) webpage.

## 8. Transportation and Hazard Constraints on Evacuation Routes

The regular travel speeds on evacuation routes will be reduced significantly due to the high number of evacuees using private automobiles. Hazard constraints include the unpredicted early

arrival of gale force winds blowing debris and sand onto evacuation routes, flooding, and the falling of objects, such as utility poles, causing road blockages, which may restrict vehicular movement out of the evacuation areas.

## 9. Evacuation Planning

All evacuations are planned so that the County's population is able to reach a safe location prior to the arrival of Tropical Storm Force Winds (TSFW), which are defined as one-minute sustained winds >39 mph or 34 knots, which have the ability to down powerlines and trees, blow out windows and signs; generate flying debris, and cause structural collapse and vehicular damage. Broward County has established planning policies which coordinate storm preparation activities and evacuation procedures to be complete prior to the arrival of TSFWs, described under the Analysis Requirements Section, subsection A.7 – Evacuation Time.

## B. Post-Disaster Redevelopment

### 1. Existing and Proposed Uses in Coastal High Hazard Areas

The allowable densities permitted within the residential categories range from an individual single family to 50 dwelling units per acre. Areas east of the Intracoastal Waterway are not permitted allocations of Flexibility Units resulting in a residential density greater than twenty-five (25) dwelling units per gross acre for the residentially designated parcel (or portion of a non-residentially designated parcel to be developed with residential use), and/or cannot exceed one hundred percent (100%) of the maximum number of dwelling units indicated for the parcel by the local land use plan map, whichever resulting residential density is less (Broward Land Use Plan (LUP) Policy 2.2.4).

### 2. Structures with a History of Repeated Damage in Coastal Storms

A "repetitive loss property" is an insurable property where, since 1978, the National Flood Insurance Program has paid at least two (2) claims of more than \$1,000 within 10 years. There are over 700 such properties in Broward County located, in every municipality except Sea Ranch Lakes. Broward County and its municipalities should strive to reduce the number of repetitive loss properties.

Pursuant to Section 161.053, Florida Statutes, the Coastal Construction Control Line (CCCL) is a jurisdictional line that defines the landward limit of the Florida Department of Environment Protection's (DEP) authority to regulate construction. The Florida Department of Environmental Protection (DEP) does allow rebuilding seaward of the CCCL; however, structures must comply with the siting and design standards of Section 161.053, F.S., and Chapter 62B-33, F.A.C.. This is administered through two State-level programs: the Beach Erosion Control Program, which provides for the restoration and maintenance of critically eroding beaches, and the Joint Coastal Permit Program, which protects the shoreline from activities which could contribute to erosion, water pollution or habitat degradation.

Certain projects are exempt from DEP permitting requirements, such as the repair, maintenance or modification of existing structures within the confines of the existing foundation and not involving work on the foundation itself. In addition, existing structures may be relocated to a landward location or an improved foundation if it creates no additional adverse impacts to the beach and dune system.

### 3. Infrastructure in Coastal High Hazard Areas

Public funds for infrastructure improvements should not be used in coastal high-hazard areas unless such funds are necessary to provide service to the existing development and to provide adequate evacuation in the event of a natural disaster. The inventories of infrastructure, including streets, highways, sewer and drainage systems, are addressed in the Coastal Management Element Support Document, Data Requirements, Section G.

### 4. Beach and Dune Conditions

Since most dunes have been destroyed by coastal overdevelopment, the replenishment of the dune system is necessary to mitigate the impact of destruction by natural storms. Mitigation projects should focus on the enhancement of natural resources such as beach nourishment and revegetation beach areas to create sand dunes. The inventories of beach and dune systems have been addressed in the Coastal Management Element Support Document, Data Requirements, Section F.

## C. Coastal High Hazard Areas

Broward County has identified its Coastal High-hazard Area as the land and water eastward of the Intracoastal Waterway to the Atlantic Ocean, including any coastal protection structures. The Broward County Planning Council maintains a Broward County coastal high-hazard area map (a.k.a. Floodplains, Flood Prone Areas and Coastal Storm Area Map) with information received from Regional Emergency Services and Communications the Emergency Management Division, as part of the Natural Resource Map Series of BrowardNEXT (see also Broward County Comprehensive Plan Map Series: Maps WM-7 and ND-1).

# Analysis Requirements

## A. Hurricane Evacuation Analysis

The Broward Comprehensive Emergency Management Plan (CEMP) consists two components – the Basic Plan and its supporting Emergency Support Function (ESF) Standard Operating Procedures (SOPs). The CEMP was most recently adopted in 2015, in accordance with the adoption provisions of Florida Statutes Chapter 252 and Rule FAC 27P-6 of the Florida Administrative Code.

The Basic CEMP provides a comprehensive overview of Broward County Regional Emergency Services & Communications (RESC), its policies and procedures. It offers a general framework for all involved agencies to follow the phases of the County’s approach to emergency activities and operations. The CEMP utilizes the organizational and procedural protocols of the Incident Command System (ICS) which organizes resources for disaster response and post disaster recovery. It also fully incorporates the policies, protocols, and procedures of the National Incident Management System (NIMS).

The following evacuation planning issues included in the CEMP are analyzed in this section: hurricane vulnerability zones; number of persons requiring evacuation; number of available hurricane shelters and shelter spaces; evacuation routes; transportation and hazard constraints on the evacuation routes; and evacuation time.

### 1. Hurricane Vulnerability Zones

There are two zones for evacuation: A and B. The barrier island is located within evacuation Zone A. Because of the limited number of bridges over the Intracoastal Waterway – a total of 11 – there are few viable alternatives to change the zones or the evacuation routes. The Broward Municipal Services District (BMSD) (i.e., the unincorporated neighborhoods) are located west of Federal Highway (US 1) and therefore fall outside of the evacuation Zones A and B.

### 2. Persons Requiring Evacuation

All persons who reside on the barrier island are required to evacuate in the event of a Saffir/Simpson Category 1-2 hurricane intensity, which also falls into the Hurricane Evacuation Zone A, and the approximate number of residents subject to an evacuation order are 44,775. More than 99,378 persons are estimated to live in coastal areas and mobile homes vulnerable to storm surges and winds in a Category 3 through 5 strength hurricane.

### 3. Available Hurricane Shelters and Spaces

Broward County has a total of 41 public school sites which currently serve as emergency shelters during a hurricane or other natural disaster, five (5) of which are designated as special needs shelters. Additional shelters have been opened as needed to accommodate more residents if everyone within the evacuation zone and in mobile homes required sheltering. The County coordinates with local governments to ensure sufficient staffing of the shelters.

#### 4. Vulnerable Population

Approximately ten percent of Broward County's total population are estimated to have a vulnerability and ten percent of that vulnerable population wants/needs sheltering during a natural disaster or other emergency. Broward County's Vulnerable Population Registry (VPR) allows residents to register with their city which enables emergency workers to improve recovery effort planning following a natural disaster or other emergency. The VPR does not involve sheltering or transportation services and each municipality utilizes the VPR based on their own independent recovery plans. According to Broward County Regional Emergency Services and Communications, approximately 3,600 people are included on the Vulnerable Population Registry.

#### 5. Evacuation Routes

As shown on Map ND-1 in the BrowardNEXT Map Series, there are a twelve (12) east-west evacuation routes leading from and into the hurricane evacuation area in Broward County. State Road (SR) A-1-A is a two-lane undivided highway. If these evacuation routes are not flooded and the bridges are maintained in good working order, these routes would be sufficient and the evacuation plan could be carried out in a timely manner.

#### 6. Transportation and Hazard Constraints on Routes

The normal speeds on evacuation routes will be reduced significantly due to the high number of evacuees using private automobiles. The torrential rains and tropical storm force winds generated by the outer bands of a hurricane often render evacuation routes impassable long before the predicted landfall of the storm. Hazard constraints include the unpredicted early arrival of gale force winds blowing debris and sand onto evacuation routes, flooding, and the falling of objects, such as utility poles causing road blockages, and thereby restricting vehicular movement out of the evacuation areas. Human made hazards may also exist as many residents wait until the final opportunity to make evacuate plans.

In the event of hurricane evacuation requirements, both boat and vehicle traffic will be hectic, creating-transportation constraints. Power outages and high winds impacting traffic controls at intersections along with the removal of disabled vehicle removals are also sources of concerns. Municipal, county, and state law enforcement officers have been assigned to direct traffic at the coastal major intersections. The maintenance of optimum traffic flow is critical, especially along State Road A-1-A, which is the main north-south thoroughfare east of the Intracoastal Waterway primarily serving Evacuation Zone A. Due to the roadway's vulnerability to inundation by severe wave action and tidal surge, access to one or more of the nine evacuation routes may be restricted.

#### 7. Evacuation Time

Broward County Regional Emergency Services and Communications (RESC) in cooperation with the Broward County Enterprise Technology Service (ETS) Division has developed a computer

program, Storm Action Lead Time (SALT), to assist in natural disaster decision making processes, including evacuation times. Forecasts from the National Hurricane Center and Miami Weather Service (NWS) are entered into the application which generates operational tasks and assigns them a lead-time based on the intensity of the storm and the estimated arrival of tropical storm force winds (TSFW). These SALT-based activity schedules are tentative as they are based on the most current NHC advisory.

Broward County's [Comprehensive Emergency Management Plan](#) (CEMP) is a decision-making tool, in addition to a guide for coordinating efforts and resources in emergency situations. The following elements in the current CEMP (2015) are based on the arrival of TSFW, defined as one-minute sustained winds >39 mph or 34 knots, and have replaced previous evacuation timing procedures:

1. Clearance Time is a fixed estimate of time required to evacuate a given area and is determined by evacuation studies and risk analyses. Clearance times vary according to both storm and local conditions; however, this is the general period prior to arrival of TSFWs.
2. Evacuation Start Time is the very latest time by which an evacuation could be initiated and completed prior to the arrival of TSFWs. The time between Evacuation Start Time and arrival of TSFW must be greater or equal to the clearance time.
3. Decision Time is the amount of time available before the latest issuance of a protective action to allow adequate response time for the threatened population. Typically, Decision Time will be greater than Evacuation Start Time in order to provide time for evacuation preparations such as closing bridges, preparing evacuation routes and opening shelters.

Countywide evacuation and pre-storm prep activities will stop once TSFWs arrive. In order to decrease evacuation times during a hurricane emergency, Broward County Regional Emergency Services and Communications also annually reviews and approves hospitals, nursing homes, ambulatory surgical centers and adult living facilities and other residential health care facility's comprehensive emergency management plans.

## B. Post-Disaster Redevelopment

The CEMP Recovery Plan specifically addresses the recovery phase of a disaster and includes specific recovery actions from the response stage through the long term recovery stage of a disaster, enabling a rapid and efficient delivery of recovery operations following a natural disaster.

### 1. Peril of Flood Legislation

In 2015, the State Legislature adopted "Peril of Flood" legislation that was added to Section 163.3178 Coastal management, F.S. Subsection (2)(f) adds the requirement for, "A redevelopment

component that outlines the principles that must be used to eliminate inappropriate and unsafe development in the coastal areas when opportunities arise.” The component must:

1. Include development and redevelopment principles, strategies, and engineering solutions that reduce the flood risk in coastal areas which results from high-tide events, storm surge, flash floods, stormwater runoff, and the related impacts of sea-level rise.
2. Encourage the use of best practices development and redevelopment principles, strategies, and engineering solutions that will result in the removal of coastal real property from flood zone designations established by the Federal Emergency Management Agency.
3. Identify site development techniques and best practices that may reduce losses due to flooding and claims made under flood insurance policies issued in this state.
4. Be consistent with, or more stringent than, the flood-resistant construction requirements in the Florida Building Code and applicable flood plain management regulations set forth in 44 C.F.R. part 60.
5. Require that any construction activities seaward of the coastal construction control lines established pursuant to s. 161.053 be consistent with chapter 161.
6. Encourage local governments to participate in the National Flood Insurance Program Community Rating System administered by the Federal Emergency Management Agency to achieve flood insurance premium discounts for their residents.”

These requirements are being met through multiple policies that appear in the Climate Change, Coastal Management, Intergovernmental Coordination, Natural Disaster, and Water Management Elements, in addition to the Broward Municipal Services District Land Use and Community Planning Element. A new policy has been added to the Natural Disaster Element, ND7.6, which states:

Broward County shall develop strategies and policies to address post disaster redevelopment issues, such as:

1. Expediting demolition of abandoned significantly damaged structures;
2. Requiring utility and infrastructure improvements that reduce vulnerability to storms and disasters;
3. Promoting energy efficient, heat reduction, and storm resilient features in the redevelopment of neighborhoods, including solar farms and replanting trees;
4. Improving drainage and raising structures, driveways and streets to avoid flooding damages;
5. Restricting redevelopment of properties in areas prone to repeat flood, wind or fire damage;
6. Addressing resiliency of mobile homes and other types of manufactured homes;
7. Transferring of title of abandoned properties within a reasonable time frame to promote expedited redevelopment.

## 2. Local Mitigation Strategy (LMS) and Enhanced Local Mitigation Strategy (ELMS)

Prior to the creation of the Local Mitigation Strategy (LMS) in 2012, there was no existing comprehensive, cohesive or coordinated post-disaster redevelopment and mitigation plan for Broward County and its 31 municipalities, of which 9 are coastal cities with over 150,000 residents, to reduce or eliminate exposure to hazard impacts.

In 2013, the Board of County Commissioners adopted an Enhanced LMS (ELMS) which included enhanced components beyond FEMA's and the State of Florida's planning requirements. In 2017, the County used a FEMA mitigation grant to update the ELMS plan once again. The ELMS provides a comprehensive and coordinated hazard mitigation program for Broward County and its 31 municipalities to deal with emergency response and recovery issues, long and short term planning issues and economic issues relating to mitigation.

Broward County is vulnerable to a wide range of natural and human caused hazards that threaten life and property. FEMA's current regulations and direction under the Disaster Mitigation Act of 2000) require an evaluation of all naturally occurring hazards and may also incorporate man-made hazards. A list of Broward County's most significant hazards of concern is shown below, and a risk assessment of these hazards is conducted in conjunction with each iteration of the Enhanced Local Mitigation Strategy (ELMS).

**Table ND-3:** Hazards Affecting Broward County

Natural Hazards	Human-Caused Hazards
Extreme Heat	Pandemic/Infectious Disease
Severe Storm/Tornado	Mass Migration
Tropical Cyclone (Storms/Hurricanes)	Terrorism
Coastal Erosion	Hazardous Material Incident
Drought	
Flood	
Sea Level Rise/Climate Change	
Wildfire	

*Source: Broward County CEMP 2015.*

## 3. Emergency Generators

To assist in post-disaster recovery efforts, the State of Florida requires the installation of emergency generators for retail motor fuel dispensing facilities. In accordance with Chapter 526.143, Florida Statutes, any generators suffering storm damage must be replaced with an alternative source within 36 hours of a natural disaster occurrence. Local building inspectors conduct equipment and operations checks, prior to the issuance of certificates of occupancy (CO), and each service station must maintain equipment records capability and testing. Although generators are not currently mandated for other retail uses, Regional Emergency Services and Communications has identified



approximately 137 generator-ready businesses, including grocery, home improvement and wholesale warehouse stores. These businesses, listed in Appendix ND-D, may be open for business after a storm, natural disaster or other emergency resulting in a prolonged power outage.

In 2018, the Governor signed into law Rule 59A-4.1265, F.A.C. (House Bill 7099) which appears under the Minimum Standards for Nursing Homes. The Rule requires that existing Florida nursing homes satisfy the following by June 1, 2018:

- Maintain an alternative power source, such as a generator, that can air-condition an area of no less than 30 net sq. ft. per resident at a temperature of 81 degrees Fahrenheit or lower for at least 96 hours, and
- Keep 72 hours of fuel on-site.

Extensions for compliance may be granted by the Agency for Health Care Administration until January 1, 2019, for nursing homes experiencing delayed construction, product delivery and/or permitting processes.

### C. Coastal High-Hazard Areas

The County has analyzed relocation of any County owned or operated infrastructure located in coastal high-hazard areas. However, the County is only responsible for maintaining the roadway network, except for State Road A-1-A which is under the jurisdiction of the Florida Department of Transportation (FDOT). All beach related equipment would be removed in preparation for a storm.

Broward County will not utilize public funds for infrastructure expansion or improvements in coastal high-hazard areas unless such funds are necessary to provide services to the existing development and to provide adequate evacuation in the event of an emergency. To reduce hurricane damage and decrease population densities, it is desirable to direct population concentrations away from the coastal high-hazard area.

# Implementation

## A. Authority

The Florida Emergency Management Act, Chapter 252, Florida Statutes, mandates the establishment and maintenance of a local emergency management agency in support of the state comprehensive emergency management plan and program. Natural disaster planning in Broward County is addressed primarily by Broward County Regional Emergency Services and Communications, enabled by Section 8.20 of the Broward County Administrative Code. In addition, all County divisions are involved in disaster planning activities in accordance with the Broward Emergency Response Team (BERT) Emergency Operation Center Manual.

## B. Sources

Broward County Regional Emergency Services and Communications the primary source for the data and analysis included in the NDC Support Document. Other sources include the Broward County Planning and Development Management Division, the School Board of Broward County and the Department of Health in Broward County.

# Appendix

## Appendix ND-A: Hurricane Evacuation Routes, 2018

Evacuation Route	East Terminus	West Terminus	Roadway Jurisdiction	Barrier Island Access
Hillsboro Blvd.	A1A	I-95	FDOT	Yes
SW 10 <sup>th</sup> Street	US 1	Sawgrass Expressway	FDOT / City of Deerfield Beach	No
Sample Road	US 1	I-95	FDOT	No
Copans Road	US 1	I-95	Broward County	No
NE 14 <sup>th</sup> Street	A1A	US 1	FDOT	Yes
Atlantic Blvd.	A1A	I-95	City of Pompano Beach / FDOT	Yes
Cypress Creek Rd	US 1	I-95	Broward County	No
Commercial Blvd.	A1A	I-95	FDOT	Yes
Oakland Park Blvd.	A1A	I-95	FDOT	Yes
Sunrise Blvd.	A1A	I-95	FDOT	Yes
Broward Blvd.	US 1	I-95	FDOT	No
Las Olas Blvd.	A1A	US 1	FDOT / City of Fort Lauderdale	Yes
Davie Blvd	US 1	I-95	FDOT	No
SE 17 <sup>th</sup> Street	Harbor Beach Pkwy	US 1	FDOT	Yes
SR 84	US 1	I-95	FDOT	No
Griffin Road	US 1	I-95	FDOT	No
Dania Beach Blvd.	A1A	US 1	FDOT	Yes
Stirling Road	US 1	I-95	FDOT	No
Sheridan Street	A1A	I-95	FDOT	Yes
Johnson Street	US 1	I-95	City of Hollywood	No
Hollywood Blvd.	A1A	I-95	FDOT / City of Hollywood	Yes
Pembroke Road	US 1	I-95	FDOT	No
Hallandale Beach. Blvd.	A1A	I-95	FDOT	Yes

Source: Planning and Development Management Division, 2018.

## Appendix ND-B: Emergency Shelters in Broward County, 2020

School Name	Type	Address
4. Arthur Ashe Rock Island	General Population	1701 NW 23rd Ave, Fort Lauderdale, FL 33311
5. Beachside ES	General Population	2230 Lincoln St, Hollywood, FL 33020
6. Coconut Palm ES	General Population	13601 Monarch Lakes Blvd, Miramar, FL 33027
7. Coral Cove ES	General Population	5100 SW 148th Ave, Miramar, FL 33027
8. Coral Glades HS	General Population	2700 Sortsplex Dr, Coral Springs, FL 33065
9. Dolphin Bay ES	General Population	16450 Miramar Pkwy , Miramar, FL 33027
10. Everglades ES	General Population	2900 Bonaventure Blvd, Weston, FL 33331
11. Everglades HS	Pet Friendly	17100 SW 48th Ct, Miramar, FL 33027
12. Falcon Cove MS	Pet Friendly	4251 Bonaventure Blvd, Weston, FL 33332
13. Fox Trail ES	General Population	1250 S Nob Hill Rd, Davie, FL 33324
14. Gator Run ES	General Population	1101 Arvida Pkwy, Weston, FL 33326
15. Hallandale ES (Gulfstream Acd)	General Population	1000 SW 3rd St, Hallandale Beach, FL 33009
16. Lakeside ES	General Population	900 NW 136th Ave, Pembroke Pines, FL 33028
17. Liberty ES	General Population	2460 Banks Rd, Margate, FL 33063
18. Lyons Creek MS	Pet Friendly	4333 Sol Press Blvd, Coconut Creek, FL 33073
19. Manatee Bay ES	General Population	19200 SW 36th St, Weston, FL 33331
20. Monarch HS	General Population	5050 Wiles Rd, Coconut Creek, FL 33066
21. New Renaissance MS	General Population	10701 MIRAMAR BLVD, Miramar, FL 33027
22. Orange Brook ES	General Population	715 S 46th Ave, Hollywood, FL 33021
23. Panther Run ES	General Population	801 SW 172nd Ave, Pembroke Pines, FL 33029
24. Park Lakes ES	General Population	3925 N SR7 , Lauderdale Lakes, FL 33319
25. Park Trails ES	General Population	10700 Trails End, Parkland, FL 33076
26. Parkside ES	General Population	10257 NW 29th St, Coral Springs, FL 33065
27. Pines MS	General Population	200 N Douglas Rd, Pembroke Pines, FL 33024
28. Plantation ES	General Population	651 NW 42nd Ave, Plantation, FL 33317
29. Pompano Beach HS	General Population	600 NE 13th Ave, Pompano Beach, FL 33060
30. Silver Lakes ES	General Population	2300 SW 173rd Ave, Miramar, FL 33029
31. Silver Palms ES	General Population	1209 NW 155th Ave, Pembroke Pines, FL 33028
32. Silver Shores ES	General Population	1701 SW 160th Ave, Miramar, FL 33027
33. Sunset Lakes ES	General Population	18400 SW 25th St, Miramar, FL 33027
34. Tradewinds ES	General Population	5400 Johnson Rd, Coconut Creek, FL 33073
35. Watkins ES	General Population	3520 SW 52nd Ave, Pembroke Park, FL 33023
36. West Broward HS	General Population	500 NW 209 Ave, Pembroke Pines, FL 33029

Source: Broward County Emergency Management Division, March 2020.



**Appendix ND-D: Generator-Ready Businesses in Broward County, August 2017**

Name	Business Type	Location
Home Depot	Home Improvement	4450 N SR 7, Coconut Creek
Publix	Grocery	5365 Lyons Rd, Coconut Creek
Publix	Grocery	6570 N SR7, Coconut Creek
Publix	Grocery	4760 W Hillsboro Blvd, Coconut Creek
Publix	Grocery	4849 Coconut Crk Pkwy, Coconut Creek
Publix	Grocery	5656 S Flamingo Rd, Cooper City
Publix	Grocery	10018 Griffin Rd, Cooper City
Publix	Grocery	9359 Sheridan St, Cooper City
Home Depot	Home Improvement	750 N University Dr, Coral Springs
Lowe's	Home Improvement	3651 Turtle Creek Dr, Coral Springs
Publix	Grocery	11600 W Sample Rd, Coral Springs
Publix	Grocery	6270 W Sample Rd, Coral Springs
Publix	Grocery	2201 N University Dr, Coral Springs
Publix	Grocery	8160 Wiles Rd, Coral Springs
Publix	Grocery	5950 Coral Ridge Dr, Coral Springs
Publix	Grocery	1400 Coral Ridge Dr, Coral Springs
Publix	Grocery	1305 University Dr, Coral Springs
Publix	Grocery	10701 Wiles Rd, Coral Springs
SuperTarget	Retail	4400 N SR 7, Coral Springs
Target	Retail	9600 Westview Dr, Coral Springs
Publix	Grocery	402 E Dania Beach Blvd, Dania Beach
Publix	Grocery	3102 Griffin Rd, Dania Beach
Costco	Warehouse Club	1890 S University Dr, Davie
Home Depot	Home Improvement	5801 S University Dr, Davie
Home Depot	Home Improvement	2300 S University Dr, Davie
Home Depot	Home Improvement	15885 Rick Case Honda Way, Davie
Publix	Grocery	8842 W SR 84, Davie
Publix	Grocery	6525 Nova Dr, Davie
Publix	Grocery	5997 Stirling Rd, Davie
Publix	Grocery	4901 Volunteer Rd, Davie
Publix	Grocery	13700 SR 84, Davie
Publix	Grocery	4901 SW 148th Ave, Davie
Publix	Grocery	4701 S University Dr, Davie
SuperTarget	Retail	5800 S University Dr, Davie
Whole Foods	Grocery	1903 S University Dr, Davie
Home Depot	Home Improvement	60 SW 12 Ave, Deerfield Beach
Publix	Grocery	3740 W Hillsboro Blvd, Deerfield Beach
Publix	Grocery	1337 S Military Trl, Deerfield Beach
Publix	Grocery	150 S Federal Hwy, Deerfield Beach
SuperTarget	Retail	3599 W Hillsboro Blvd, Deerfield Beach

Name	Business Type	Location
Target	Retail	1200 S Federal Hwy, Deerfield Beach
BJs Wholesale Club	Warehouse Club	5100 NW 9 Ave, Ft. Lauderdale
Home Depot	Home Improvement	1000 NE 4 Ave, Ft. Lauderdale
Publix	Grocery	3500 Davie Blvd, Ft. Lauderdale
Publix	Grocery	2501 E Sunrise Blvd, Ft. Lauderdale
Publix	Grocery	1415 E Sunrise Blvd, Ft. Lauderdale
Publix	Grocery	1950 Cordova Rd, Ft. Lauderdale
Publix	Grocery	3400 N Federal Hwy, Ft. Lauderdale
Publix	Grocery	601 S Andrews Ave, Ft. Lauderdale
Target	Retail	3200 N Federal Hwy, Ft. Lauderdale
Whole Foods	Grocery	2000 N Federal Hwy, Ft. Lauderdale
Publix	Grocery	1400 E Hallandale Bch Blvd, Hallandale Beach
Winn Dixie	Grocery	1515 E Hallandale Bch Blvd, Hallandale Beach
BJs Wholesale Club	Warehouse Club	4000 Oakwood Blvd, Hollywood
Home Depot	Home Improvement	1951 S SR 7, Hollywood
Home Depot	Home Improvement	3401 Oakwood Blvd, Hollywood
Penn Dutch	Grocery	3950 N 28 Terr, Hollywood
Publix	Grocery	3251 Hollywood Blvd, Hollywood
Publix	Grocery	1700 Sheridan St, Hollywood
Publix	Grocery	6901 Taft St, Hollywood
Sedano's	Grocery	2319 N 60 Ave, Hollywood
Target	Retail	300 Hollywood Mall, Hollywood
Winn Dixie	Grocery	6775 Taft St, Hollywood
Publix	Grocery	5855 W Oakland Park Blvd, Lauderhill
SuperTarget	Retail	7730 W Commercial Blvd, Lauderhill
Publix	Grocery	2450 N Federal Hwy, Lighthouse Point
Publix	Grocery	3700 N Federal Hwy, Lighthouse Point
Penn Dutch	Grocery	3201 N SR 7, Margate
Publix	Grocery	7230 W Atlantic Blvd, Margate
Winn Dixie	Grocery	5600 W Sample Rd, Margate
Home Depot	Home Improvement	3183 SW 160 Avenue, Miramar
Publix	Grocery	9951 Miramar Pkwy, Miramar
Publix	Grocery	11000 Pembroke Rd, Miramar
Publix	Grocery	18409 Miramar Pkwy, Miramar
Publix	Grocery	14375 Miramar Pkwy, Miramar
Publix	Grocery	6890 Miramar Pkwy, Miramar
SuperTarget	Grocery	16901 Miramar Pkwy, Miramar
Home Depot	Home Improvement	1195 S SR 7, North Lauderdale
Publix	Grocery	1297 S SR 7, North Lauderdale
Publix	Grocery	8140 W McNab Rd, North Lauderdale
Sedano's	Grocery	7208 Southgate Blvd, North Lauderdale

Name	Business Type	Location
Home Depot	Home Improvement	1701 W Oakland Park Blvd, Oakland Park
Lowe's	Home Improvement	1001 W Oakland Park Blvd, Oakland Park
Publix	Grocery	1003 E Commercial Blvd, Oakland Park
Safeway	Grocery	950 E Commercial Blvd, Oakland Park
BJ's Wholesale Club	Warehouse Club	5901 W Hillsboro Blvd, Parkland
Publix	Grocery	8095 N University Dr, Parkland
BJ's Wholesale Club	Warehouse Club	13700 Pines Blvd, Pembroke Pines
Costco	Warehouse Club	15915 Pines Blvd, Pembroke Pines
Home Depot	Home Improvement	11001 Pines Blvd, Pembroke Pines
Lowe's	Home Improvement	130 N University Dr, Pembroke Pines
Publix	Grocery	600 N University Dr, Pembroke Pines
Publix	Grocery	19441 Sheridan St, Pembroke Pines
Publix	Grocery	18341 Pines Blvd, Pembroke Pines
Publix	Grocery	170 S Flamingo Rd, Pembroke Pines
Publix	Grocery	15729 Pines Blvd, Pembroke Pines
Publix	Grocery	1657 N Hiatus Rd, Pembroke Pines
Sedano's	Grocery	10333 Pines Blvd, Pembroke Pines
Sedano's	Grocery	17171 Pines Blvd, Pembroke Pines
Target	Retail	11253 Pines Blvd, Pembroke Pines
Whole Foods	Grocery	14956 Pines Blvd, Pembroke Pines
Fresh Market, The	Grocery	12171 W Sunrise Blvd, Plantation
Publix	Grocery	225 S Flamingo Rd, Plantation
Publix	Grocery	1181 S University Dr, Plantation
Publix	Grocery	10065 Cleary Blvd, Plantation
Publix	Grocery	8101 W Sunrise Blvd, Plantation
Publix	Grocery	6921 W Broward Blvd, Plantation
Target	Retail	8201 Federated West Roadway, Plantation
Costco	Warehouse Club	1800 W Sample Rd, Pompano Beach
Home Depot	Home Improvement	1151 NW Copans Rd, Pompano Beach
Lowe's	Home Improvement	1851 N Federal Hwy, Pompano Beach
Publix	Grocery	1405 S Federal Hwy, Pompano Beach
Publix	Grocery	411 S Cypress Rd, Pompano Beach
Publix	Grocery	1140 SW 36 Ave, Pompano Beach
Publix	Grocery	2511 E Atlantic Blvd, Pompano Beach
Winn Dixie	Grocery	3435 N Federal Hwy, Pompano Beach
Publix	Grocery	4703 N Ocean Dr, Sea Ranch Lakes
Lowe's	Home Improvement	6600 Dykes Rd, Southwest Ranches
Publix	Grocery	15801 Sheridan St, Southwest Ranches
Home Depot	Home Improvement	12525 W Sunrise Blvd, Sunrise
Home Depot	Home Improvement	2901 N University Dr, Sunrise
Lowe's	Home Improvement	8050 W Oakland Park Blvd, Sunrise



Name	Business Type	Location
Publix	Grocery	9300 W Commercial Blvd, Sunrise
Publix	Grocery	10155 W Oakland Park Blvd, Sunrise
Publix	Grocery	12500 W Sunrise Blvd, Sunrise, FL
SuperTarget	Retail	12801 W Sunrise Blvd, Sunrise
Publix	Grocery	881 N University Dr, Tamarac
Publix	Grocery	4121 W Commercial Blvd, Tamarac
Publix	Grocery	8245 NW 88 Ave, Tamarac
Winn Dixie	Grocery	7015 N University Dr, Tamarac
Publix	Grocery	294 Indian Trace, Weston
Publix	Grocery	1170 Weston Rd, Weston
Publix	Grocery	4567 Weston Rd, Weston
Publix	Grocery	1601 Promenade Blvd, Weston
Publix	Grocery	2465 Glades Cir, Weston
Publix	Grocery	2633 N Dixie Hwy, Wilton Manors
Publix	Grocery	100 W Oakland Park Blvd, Wilton Manors

*Source: Broward County Emergency Management Division, August 9, 2017.*