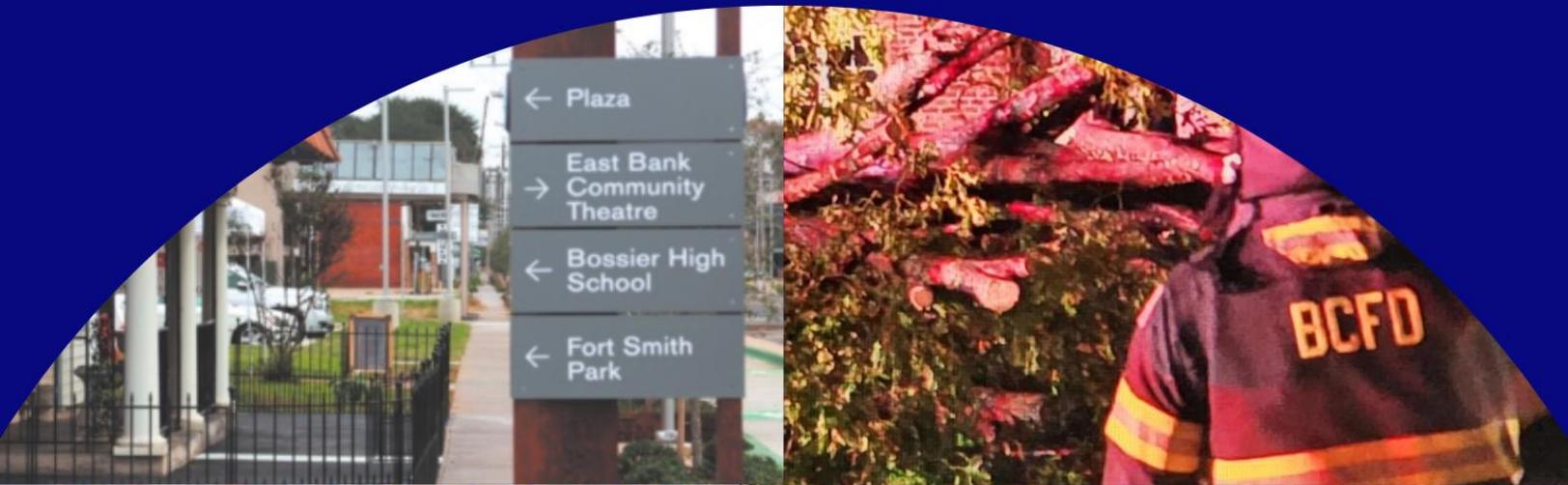


# 2023 BOSSIER MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

BOSSIER CITY, BENTON,  
HAUGHTON, PLAIN DEALING,  
UNINCOPRATED BOSSIER  
PARISH





# BOSSIER PARISH MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE

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**Bossier Parish**



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## ACKNOWLEDGMENTS

This 2023 Bossier Parish Hazard Mitigation Plan Update was coordinated by the Bossier Parish Hazard Mitigation Plan Update Planning Committee, in collaboration with community stakeholders and the general public. The participating jurisdictions are made up of the following communities:

Unincorporated Bossier Parish  
 Town of Benton  
 City of Bossier City  
 Town of Haughton  
 Town of Plain Dealing

Special thanks is directed to all of those who assisted in contributing their expertise and feedback on this document, especially the Bossier Parish Office of Homeland Security and Emergency Management. These combined efforts have made this project possible. The Bossier Parish Planning Committee consists of the following individuals, who are credited in the creation of this document:

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## 1. Introduction

Hazard Mitigation is defined as sustained actions taken to reduce or eliminate long-term risk from hazards and their effects. Hazard Mitigation Planning is the process through which natural hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies that would lessen the impacts are determined, prioritized, and implemented.

In that regard, this plan (a) documents the Bossier Parish Hazard Mitigation Plan Update (HMPU) process; (b) identifies natural hazards and risks within the parish; and (c) identifies the parish's hazard mitigation strategy to make Bossier Parish and its jurisdictions less vulnerable and more disaster resilient. It also includes mitigation project scoping to further identify scopes of work, funding sources, and implementation timing requirements of proposed selected mitigation projects. Information in the plan will be used to help guide and coordinate mitigation and local policy decisions affecting future land use.

The Bossier Parish Hazard Mitigation Plan is a multi-jurisdictional plan that includes the following jurisdictions which participated in the planning process:

- Bossier Parish
- Town of Benton
- City of Bossier City
- Town of Haughton
- Town of Plain Dealing

The Federal Emergency Management Agency (FEMA), now under the Department of Homeland Security, has made reducing losses from natural disasters one of its primary goals. The Hazard Mitigation Plan (HMP) and subsequent implementation of recommended projects, measures, and policies is the primary means to achieving these goals. Mitigation planning and project implementation has become even more significant in a post-Katrina/Rita, Gustav/Ike, and Laura/Delta environment in south Louisiana.

This Hazard Mitigation Plan is a comprehensive plan for disaster resiliency in Bossier Parish. The parish is subject to natural hazards that threaten life and health and have caused extensive property damage. To better understand these hazards and their impacts on people and property, and to identify ways to reduce those impacts, the parish's Office of Homeland Security and Emergency Preparedness undertook this Natural Hazards Mitigation Plan. "Hazard mitigation" does not mean that all hazards are stopped or prevented. It does not suggest complete elimination of the damage or disruption caused by such incidents. Natural forces are powerful and most natural hazards are well beyond our ability to control. Mitigation does not mean quick fixes. It is a long-term approach to reduce hazard vulnerability. As defined by FEMA, "hazard mitigation" means any sustained action taken to reduce or eliminate the long-term risk to life and property from a hazard event.

Every community faces different hazards, and every community has different resources and interests to bring to bear on its problems. Because there are many ways to deal with natural hazards and many agencies that can help, there is no one solution for managing or mitigating their effects. Planning is one of the best ways to correct these shortcomings and produce a program of activities that will best mitigate the impact of local hazards and meet other local needs. A well-prepared plan will ensure that all possible activities are reviewed and implemented so that the problem is addressed by the most appropriate and efficient solutions. It can also ensure that activities are coordinated with each other and with other goals and programs, preventing conflicts and reducing the costs of implementing each individual activity.

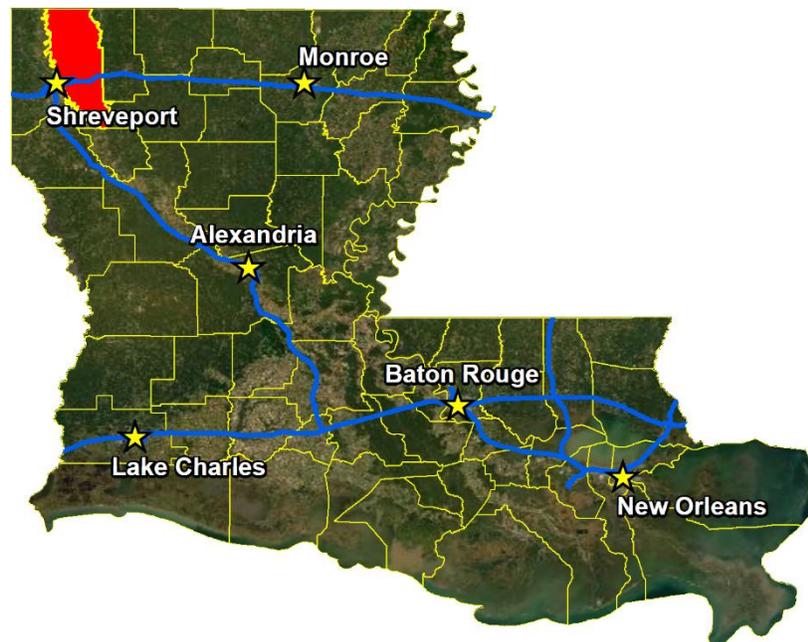
Under the Disaster Mitigation Act of 2000 (42 USC 5165), a mitigation plan is a requirement for Federal mitigation funds. Therefore, a mitigation plan will both guide the best use of mitigation funding and meet the prerequisite for obtaining such funds from FEMA. FEMA also recognizes plans through its Community Rating System (CRS), a program that reduces flood insurance premiums in participating communities. This program is further described in Section Three: Capability Assessment.

This plan identifies activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage caused by natural hazards. It fulfills the Federal mitigation planning requirements, qualifies for CRS credit, and provides Bossier Parish and its communities with a blueprint for reducing the impacts of these natural hazards on people and property.

## Geography, Population and Economy

### Geography

Bossier Parish is located in northwest Louisiana, and Bossier City is approximately 125 miles northwest of the City of Alexandria. Bossier Parish is adjacent to Red River Parish to the south, Webster and Bienville Parishes to the east, and Caddo Parish to the west. The Red River forms the border with Caddo Parish. Bossier Parish shares its northern border with the State of Arkansas. The Town of Benton is the Parish seat.



*Figure 1-1: Location of Bossier Parish in the State of Louisiana*

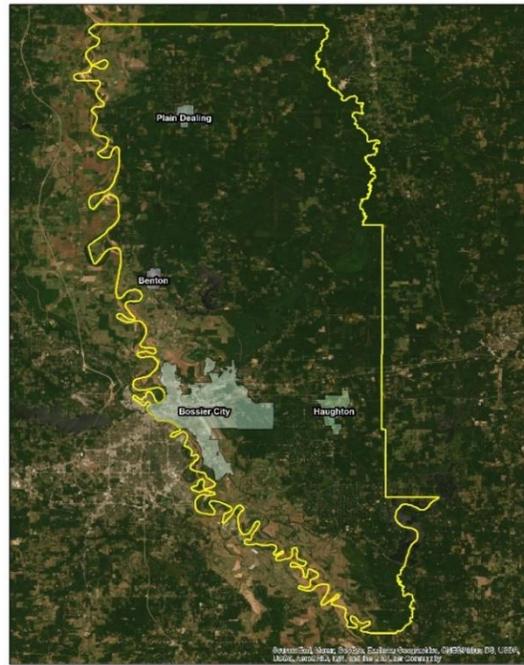


Figure 1-2: Incorporated Jurisdictions within Bossier Parish

Bossier Parish is a humid subtropical climate. Variations in daily temperature are determined by distance from the Gulf of Mexico and, to a much lesser degree, by differences in elevation. The average annual temperature for the state as a whole is 68°F. January is typically the coldest month for Louisiana, averaging approximately 54°F, while July is typically the warmest at an average of 83°F. Winter months are usually mild with cold spells of short duration. For Bossier Parish in particular, the summer months are usually quite warm, with an average daily maximum temperature in July and August of 93°F. Winters are typically mild. Snowfall averages one inch per year. Average annual rainfall for the area is 52 inches. Bossier Parish is susceptible to the normal weather dangers, such as thunderstorms and flooding. Even though Bossier is about 200 miles North of the Gulf of Mexico, the states' proximity to the gulf makes the parish susceptible to tropical cyclones. Hurricane season lasts from June 1st to November 30th, with most hurricanes forming in August, September, and October.

Bossier Parish is located in Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) Region 7 (Figure 1-3).

As noted above, Bossier Parish is located in the northwest region of Louisiana.



Figure 1-3: Louisiana Homeland Security Regions

## Population

The population of Bossier Parish is estimated at 128,746 (2020 Census) with a population percent change from April 1, 2010 – April 1, 2020 of 9.1%

*Table 1-1: Bossier Parish Population  
(Source: US Census)*

	2010 Census	2014 Estimate	2020 Census	Percent Change 2010 - 2020
<b>Total Population</b>	117,522	125,064	128,746	8.72%
<b>Population Density (Pop/Sq. Mi.)</b>	139.3	-----	153.4	9.19%
<b>Total Households</b>	49,351	54,045	55,237	10.66%
<b>Persons Per Household</b>	-----	-----	2.50	-----

## Economy

The Bossier Parish economy shares many similarities to its immediate neighbor to the west, Caddo Parish. Both were initially majors players in the steamboat commerce, and both also reaped the benefits from a boom in the oil and gas industry during the 1980's, and again later with the discovery of the Haynesville Shale. The major differentiating factor is that Bossier Parish is the home to Barksdale Air Force Base, the largest employer in the parish. Employing more than 10,000 people, Barksdale generates an annual economic impact of \$753.8 million for the economy of Bossier Parish and surrounding communities.

Another recent contributor to the Bossier Parish economy is the gaming industry. Bossier Parish is currently home to four casinos: Harrah's Horseshoe Casino Hotel, Louisiana Downs Casino Hotel, Boomtown Casino Hotel, and Margaritaville Resort Casino. These casinos led to an increase in tourism, along with the development and construction of the Louisiana Boardwalk along the Red River. These investments in the social and entertainment aspects of the economy have contributed to Bossier Parish becoming a tourist destination. Industry data for business patterns in Bossier Parish can be found in the table on the following page.

Table 1-2: Bossier Parish Business Patterns  
(Source: US Census, CBP)

Business Description	Number of Establishments	Number of Employees	Annual Payroll (\$1,000)
Retail Trade	439	6,556	188,398
Manufacturing	65	2,345	113,919
Health Care and Social Assistance	251	4,764	246,004
Transportation and Warehousing	90	1,210	65,916
Construction	214	1,967	95,746
Administration/Support and Waste Management/Remediation Services	115	1,393	38,334
Real Estate and Rental and Leasing	153	678	26,912
Wholesale Trade	116	1,491	76,214
Other Services (except Public Administration)	226	1,925	53,393
Accommodation and Food Services	268	8,440	152,806
Financial and Insurance	166	1,168	77,085
Professional, Scientific, and Technical Services	264	1,221	58,698
Agriculture, Forestry, Fishing and Hunting	8	134	5,045
Mining, Quarrying, and Oil and Gas Extraction	49	830	57,174
Utilities	6	46	2,801
Arts, Entertainment, and Recreation	43	880	21,221
Educational Services	21	250	5,958
Information	28	434	19,959
Management of Companies and Enterprises	14	498	25,044

## Hazard Mitigation

To fully understand hazard mitigation efforts in Bossier Parish and throughout Louisiana, it is first crucial to understand how hazard mitigation relates to the broader concept of emergency management. In the early 1980s, the newly-created Federal Emergency Management Agency (FEMA) was charged with developing a structure for how the federal, state, and local governments would respond to disasters. FEMA developed the *four phases of emergency management*, an approach which can be applied to all disasters. The four phases are as follows:

- Hazard Mitigation**—described by FEMA and the Disaster Mitigation Act of 2000 (DMA 2000) as “any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event.” The goal of mitigation is to save lives and reduce property damage. Besides significantly aiding in the obviously desirous goal of saving human lives, mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical community facilities and minimize community disruption, helping communities return to usual daily living in the aftermath of disaster. Examples of mitigation involve a range of activities and actions including the following: land-use planning, adoption and enforcement of building codes, and construction projects (e.g., flood proofing homes through elevation, or acquisition or relocation away from floodplains).

- **Emergency Preparedness**—includes plans and preparations made to save lives and property and to facilitate response operations in advance of a disaster event.
- **Disaster Response**—includes actions taken to provide emergency assistance, save lives, minimize property damage, and speed recovery immediately following a disaster.
- **Disaster Recovery**—includes actions taken to return to a normal or improved operating condition following a disaster.

*Figure 1-4* illustrates the basic relationship between these phases of emergency management. While hazard mitigation may occur both before and after a disaster event, it is significantly more effective when implemented before an event occurs. This is one of the key elements of this plan and its overall strategy: reduce risk before disaster strikes in order to minimize the need for post-disaster response and recovery.

As *Figure 1-4* demonstrates, mitigation relies on updating in the wake of disaster. This can give the appearance that mitigation is only reactive rather than proactive. In reality, post-disaster revision is a vital component of improving mitigation. Each hazardous event affords an opportunity to reduce the consequences of future occurrences.

Unfortunately, this cycle can be painful for a community. For instance, the risks of disasters that could create catastrophic incidents in Louisiana were thought to be relatively well-understood prior to 2005. However, the impact of the 2005 hurricane season on the Gulf Coast region of the United States prompted a new level of planning and engagement related to disaster response, recovery, and hazard mitigation. Hurricanes Katrina and Rita hit three weeks apart and together caused astonishing damage to human life and to property. The two storms highlighted a hurricane season that spawned 28 storms—unparalleled in American history. The 2005 hurricane season confirmed Louisiana’s extreme exposure to natural disasters and both the positive effects and the concerns resulting from engineered flood-protection solutions. More recently, the historically impactful 2020 hurricane season reinforced the need for proper planning and mitigation strategies.



*Figure 1-4: The Four Phases of Emergency Management and their Relation to Future Hazard Mitigation (Source: Louisiana State Hazard Mitigation Plan 2014)*

The catastrophic tropical events of 2005 and 2020, coupled with the unprecedented flooding events of 2016 have had profound impacts on emergency management and hazard mitigation throughout Louisiana. As detailed later in this document, significant funding has been made available to the State of Louisiana and its parishes for the purpose of hazard mitigation planning. The storms also raised awareness of the importance of hazard mitigation among decision-makers and the general population, which has been particularly important since natural hazards will likely be increasing in frequency, magnitude, and impact in the coming years due to climate change.

## General Strategy

During the last update to the Louisiana State Hazard Mitigation Plan, the State Hazard Mitigation Team (SHMT) began a long-term effort to better integrate key components of all plans with hazard mitigation implications in Louisiana to ensure that the programs, policies, recommendations, and implementation strategies are internally consistent. As each of these documents has been adopted by various agencies within the state, the SHMT has worked to incorporate this information into the decision process.

Part of the ongoing integration process is that the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) encourages the parishes and the local communities with independent hazard mitigation plans to utilize the same plan format and methodologies as the State Hazard Mitigation Plan in order to create continuity of information from local to state mitigation plans and programs.

The 2023 Bossier Parish Hazard Mitigation Plan (HMP) maintains much of the information from the 2017 plan version, but it now incorporates the order and methodologies of the 2019 Louisiana State Hazard Mitigation Plan.

The sections in the 2017 Bossier Parish HMP were as follows:

- Section One Introduction
- Section Two Hazard Identification and Parish-Wide Risk Assessment
- Section Three Capability Assessment
- Section Four Mitigation Strategy
- Appendix A Planning Process
- Appendix B Plan Maintenance
- Appendix C Essential Facilities
- Appendix D Plan Adoption
- Appendix E State Required Worksheets

This plan update also coheres with the Plain Writing Act of 2010, which requires federal agencies to use clear communication that is accessible, consistent, understandable, and useful to the public. While the State of Louisiana and its political subdivisions are not required to meet such standards, the Act aligns with best practices in hazard mitigation. Since successful hazard mitigation relies on full implementation and cooperation at all levels of government and community, a successful hazard mitigation plan must also be easily used at all of these levels. Nevertheless, the Bossier Parish Hazard Mitigation Planning Committee recognized the benefits from the successful analysis and mitigation planning executed in previous plan updates, as well as improvements to be made in the 2023 update. This plan update remains coherent with those documents, retaining language and content when needed, deleting it when appropriate, and augmenting it when constructive.

## 2023 Plan Update

This 2023 plan update proceeds with the previous goals of the Bossier Parish Hazard Mitigation Plan. The current goals are as follows:

1. Enhance and develop emergency services, including response.
2. Protect lives and property from the dangers of natural hazards.

This plan update makes a number of textual changes throughout, but the most obvious changes are data related and structural edits. First, the National Oceanic and Atmospheric Administration’s (NOAA) National Centers for Environmental Information’s (NCEI) Storm Events Database was used in the analysis, which provides historical hazard data from 1950 to 2023. The planning committee was also instrumental in providing detailed data where appropriate to more accurately reflect hazard impacts on the parish and jurisdictions. Furthermore, all of the sections were updated to reflect the most current information and the most current vision of the plan update. The most significant changes are the newly developed hazard profiles and risk assessments, as well as the removal of much repetition between sections from the previous plan updates.

The 2023 plan update is organized in the same format as the 2017 update, with one minor change to this 2023 update as outlined below:

- Section One Introduction
- Section Two Hazard Identification and Parish-Wide Risk Assessment
- Section Three Capability Assessment
- Section Four Mitigation Strategies
- Appendix A Planning Process
- Appendix B Plan Maintenance
- Appendix C Critical Facilities
- Appendix D Plan Adoption
- Appendix E State Required Worksheets

*Table 1-3: 2023 Plan Update Crosswalk*

<b>Plan Update Crosswalk</b>	
<b>2017 Update</b>	<b>2023 Update</b>
Section 1: Introduction	Section 1: Introduction
Section 2: Hazard Identification and Parish-Wide Risk Assessment	Section 2: Hazard Identification and Parish-Wide Risk Assessment
Section 3: Capability Assessment	Section 3: Capability Assessment
Section 4: Mitigation Strategy	Section 4: Mitigation Strategy
Appendix A: Planning Process	Appendix A: Planning Process
Appendix B: Plan Maintenance	Appendix B: Plan Maintenance
Appendix C: Essential Facilities	Appendix C: Critical Facilities
Appendix D: Plan Adoptions	Appendix D: Plan Adoptions
Appendix E: State Required Worksheets	Appendix E: State Required Worksheets

Despite changes in this plan update, the plan remains consistent in its emphasis on the few types of hazards that pose the most risk to loss of life, injury, and property in Bossier Parish and its municipalities. The extent of this risk is dictated primarily by its geographic location. Most significantly, Bossier Parish remains at high risk of water inundation from various sources, including flooding, tornadoes, and tropical cyclone activity. All of the parish is also at high risk of damages from high winds and wind-borne debris caused by various meteorological phenomena. Other hazards threaten the parish and/or its municipalities, although not to such great degrees and not in such widespread ways. In all cases, the relative social vulnerability of areas threatened and affected plays a significant role in how governmental agencies and their partners (local, parish, state, and federal) prepare for and respond to disasters.

Mitigation efforts related to particular hazards are highly individualized by jurisdiction. Flexibility in response and planning is essential. The most important step forward to improve hazard management capability is to improve coordination and information sharing between the various levels of government regarding hazards.

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## 2. Hazard Identification and Parish-Wide Risk Assessment

This section assesses the various hazard risks that Bossier Parish faces in order to identify a strategy for mitigation. Having identified the categories of hazards, emergencies, disasters, and catastrophes, this section details the major climatological and natural/human-influenced hazards by (1) defining them, (2) explaining how they are measured, (3) describing their geographic extent, (4) surveying their previous occurrences, and (5) evaluating their future likelihood of occurrences.

The table below provides an overview of the hazards that had been previously profiled in the Bossier Parish Hazard Mitigation Plan published in 2017, as well as the hazards that were identified in the state's 2019 Hazard Mitigation Plan that were of high or medium risk for the parish by the state. Those hazards identified as high or medium risk by the state or previously identified as a risk by the parish, have been determined to provide a risk to the parish and will be profiled in this section.

*Table 2-1: Hazard Profile Summary.*

Hazard	Profiled in Last Plan	Considered Medium or High Risk in the State's HM Plan	Profiled in the 2023 Update
Dam Failure	X		+
Drought	X		X
Earthquakes	*		*
Flooding	X	X	X
Levee Failure	X		+
Thunderstorms (Hail, Lightning, & Wind)	X	X	X
Tornadoes	X	X	X
Tropical Cyclones	X	X	X
Wildfires	X		X
Winter Weather	X		X

*\*Hazard Discounted in Previous Plan, but Profiled in this Update  
+ Data Deficiency*

### Prevalent Hazards to the Community

While many of the hazards identified in *Table 2-1* occur in the parish, their occurrence was not merited for further study by the planning committee. The determination was made to focus attention and resources on the most prevalent hazards, which include the hazards previously profiled. The following hazards have been selected to be included in this risk assessment:

- a) Dam Failure
- b) Drought
- c) Earthquakes
- d) Flooding
- e) Levee Failure
- f) Thunderstorms (Hail, Lightning, Wind)
- g) Tornadoes
- h) Tropical Cyclones
- i) Wildfires
- j) Winter Weather

For analysis purposes, the impact of the critical and prevalent hazards is summarized as follows:

- Flooding from rivers and waterways, rainstorms, tropical cyclones and hurricanes in the following forms:
  - a) Riverine
  - b) Stormwater
  - c) Surge
  - d) Backwater flooding (as the result of river flooding and surge)
  - e) Coastal
- High wind damage most commonly resulting from hurricanes, thunderstorms, and tornadoes
- Property damage resulting from all profiled natural hazards

The potential destructive power of tropical cyclones was determined to be the most prevalent hazard to the parish. Fifteen of the thirty-three disaster declarations Bossier Parish has received resulted from tropical cyclones, which validates this as the most significant hazard. Therefore, the issue of hurricanes will serve as the main focus during the mitigation planning process. Hurricanes present risks from the potential for flooding, primarily resulting from storm surge, and high wind speeds. While storm surge is considered the hazard with the most destructive potential, the risk assessment will also assess non-storm surge flooding as well. Flooding can also occur from non-hurricane events, as flash floods are a common occurrence due to heavy rainfall.

Hurricanes, tropical storms, and heavy storms are common occurrences, and resultant wind damage is of utmost concern. Damage from high winds can include roof damage, destruction of homes and commercial buildings, downed trees and power lines, and damage and disruption to services caused by heavy debris. A wind map for Bossier Parish is included in the hurricane risk assessment.

Bossier Parish is also susceptible to tornadoes. Tornadoes can spawn from tropical cyclones or severe weather systems that pass-through Bossier Parish. High winds produced by tornadoes have the potential to destroy residential and commercial buildings, as well as create wind-borne objects from the debris produced by the destruction of the natural and human environment, such as building materials and trees.

## Previous Occurrences

Table 2-2 summarizes federal disaster declarations for Bossier Parish since 1965. Information includes names, dates, and types of disaster.

Table 2-2: Bossier Parish Major Disaster Declarations.

Disaster Number	Year	Declaration
3031	2/22/1977	Drought and Freezing
567	12/6/1978	Severe Storms and Tornadoes
835	7/17/1978	Tropical Cyclone - Tropical Storm Allison
902	4/23/1991	Severe Storms and Flooding
904	5/3/1991	Severe Storms, Tornadoes, and Flooding
1012	2/28/1994	Severe Winter Ice Storm
1269	4/9/1999	Severe Storms, Tornadoes, and Flooding
1357	1/12/2001	Severe Winter Ice Storm
3172	2/1/2003	Loss of Space Shuttle Columbia
1548	9/15/2004	Tropical Cyclone – Hurricane Ivan
1603	8/29/2005	Tropical Cyclone – Hurricane Katrina
1607	9/24/2005	Tropical Cyclone – Hurricane Rita
1786	9/2/2008	Tropical Cyclone – Hurricane Gustav
1863	12/10/2009	Severe Storms, Tornadoes, and Flooding
4080	8/29/2012	Tropical Cyclone – Hurricane Isaac
4228	7/13/2015	Severe Storms and Flooding
3031	2/22/1977	Drought and Freezing
567	12/6/1978	Severe Storms and Tornadoes
835	7/17/1978	Tropical Cyclone - Tropical Storm Allison
902	4/23/1991	Severe Storms and Flooding
904	5/3/1991	Severe Storms, Tornadoes, and Flooding
4263	3/13/2016	Severe Storms, Flooding
4484	3/24/2020	COVID-19 Pandemic
3527	6/7/2020	Tropical Cyclone – Tropical Storm Cristobal
3538	8/23/2020	Tropical Cyclone – Tropical Storms Laura and Marco
4559	8/28/2020	Tropical Cyclone – Hurricane Laura
3543	9/14/2020	Tropical Cyclone – Hurricane Sally
4570	10/16/2020	Tropical Cyclone – Hurricane Delta
3549	10/27/2020	Tropical Cyclone – Tropical Storm Zeta
3556	2/18/2021	Severe Winter Storm
4590	3/9/2021	Severe Winter Storms
4611	8/29/2021	Tropical Cyclone – Hurricane Ida
3574	9/13/2021	Tropical Cyclone – Tropical Storm Nicholas

### Probability of Future Hazard Events

The probability of a hazard event occurring in Bossier Parish is estimated in the table on the following page. The percent chance of an event happening during any given year was calculated by posting past events and dividing by the time period. Unless otherwise indicated, the time period used to access probability followed the method used in the State of Louisiana's most current Hazard Mitigation Plan. The primary source for historical data used throughout the plan is the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information's (NCEI) Storm Events Database, which provides historical hazard data from 1950 to 2021. In staying consistent with the state plan, the Storm Events Database was evaluated for the last thirty years (1990 – 2021) to determine future probability of a hazard occurring. While the 31-year record used by the State was adopted for the purpose of determining the overall probability, to assist with determining estimated losses, unless otherwise stated, the full 71-year record was used when Hazus was not available to determine losses. This full record was used to provide a more extensive record to determine losses. All assessed damages were adjusted for inflation in order to reflect the equivalent amount of damages with the value of the U.S. dollar today.

The following table shows the annual probability for each hazard occurring across the parish:

*Table 2-3: Probability of Future Hazard Reoccurrence.*

Hazard	Probability				
	Unincorporated Bossier Parish	Benton	Bossier City	Haughton	Plain Dealing
<b>Dam Failure</b>	< 1%	< 1%	< 1%	< 1%	< 1%
<b>Drought</b>	36%	36%	36%	36%	36%
<b>Earthquakes</b>	< 1%	< 1%	< 1%	< 1%	< 1%
<b>Flooding</b>	100%	77%	100%	52%	65%
<b>Levee Failure</b>	< 1%	< 1%	< 1%	No Impact	No Impact
<b>Thunderstorms - Hail</b>	100%	100%	100%	100%	100%
<b>Thunderstorms - Lightning</b>	65%	65%	65%	65%	65%
<b>Thunderstorms - Winds</b>	100%	100%	100%	100%	100%
<b>Tornadoes</b>	100%	100%	100%	100%	100%
<b>Tropical Cyclones</b>	21%	21%	21%	21%	21%
<b>Wildfires</b>	< 1%	< 1%	< 1%	< 1%	< 1%
<b>Winter Weather</b>	52%	52%	52%	52%	52%

As shown in the table above, tornadoes, hailstorms, high winds, and flooding for the unincorporated area of the parish and Bossier City have the highest chance of occurrence in the parish (100%). These are followed by flooding for the incorporated area of Benton (77%), flooding for the incorporated area of Plain Dealing and lightning (65%), flooding for the incorporated area of Haughton and winter weather (52%), drought (36%), and tropical cyclones (21%). Earthquakes, wildfires, dam failure, and levee failure for the unincorporated area of Bossier Parish and the incorporated areas of Benton and Bossier City have an annual chance of occurrence of less than 1%. Levee failure for the incorporated areas of Haughton and Plain Dealing has no impact on these areas.

### Inventory of Assets for the Entire Parish

As part of the Risk Assessment, the planning team identified essential facilities throughout the parish. Several methods were used to assist in identifying all essential facilities, including field data collected by the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) on critical infrastructure from a previous hazard mitigation project.

Within the entire planning area, there is an estimated value of \$18,171,270,000 in structures throughout the parish. The table below provides the total estimated value for each type of structure by occupancy.

*Table 2-4: Estimated Total of Potential Losses throughout Bossier Parish.*

Occupancy	Bossier Parish	Unincorporated Area	Benton	Bossier City	Haughton	Plain Dealing
<b>Agricultural</b>	\$55,956,000	\$37,484,000	\$2,036,000	\$14,238,000	\$262,000	\$1,936,000
<b>Commercial</b>	\$2,782,817,000	\$1,042,249,000	\$36,094,000	\$1,671,086,000	\$7,588,000	\$25,800,000
<b>Government</b>	\$223,045,000	\$48,249,000	\$64,243,000	\$108,656,000	\$35,000	\$1,862,000
<b>Industrial</b>	\$655,473,000	\$362,112,000	\$4,559,000	\$286,050,000	\$314,000	\$2,438,000
<b>Religion</b>	\$386,096,000	\$173,032,000	\$7,938,000	\$192,486,000	\$6,406,000	\$6,234,000
<b>Residential</b>	\$13,963,500,000	\$7,228,180,000	\$128,223,000	\$6,433,846,000	\$107,510,000	\$65,741,000
<b>Education</b>	\$104,383,000	\$47,656,000	\$3,262,000	\$46,554,000	\$25,000	\$6,886,000
<b>Total</b>	<b>\$18,171,270,000</b>	<b>\$8,938,962,000</b>	<b>\$246,355,000</b>	<b>\$8,752,916,000</b>	<b>\$122,140,000</b>	<b>\$110,897,000</b>

Critical Facilities of the Parish

The following figures show the locations and names of the critical facilities within the parish:

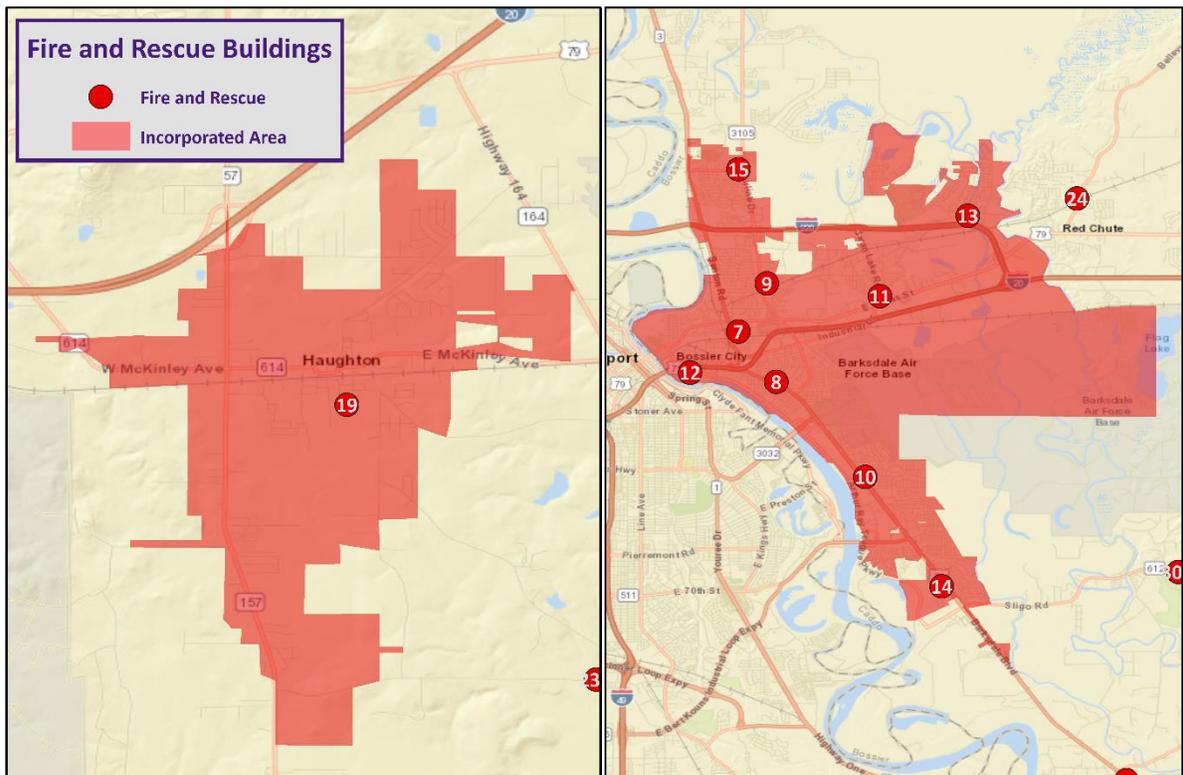
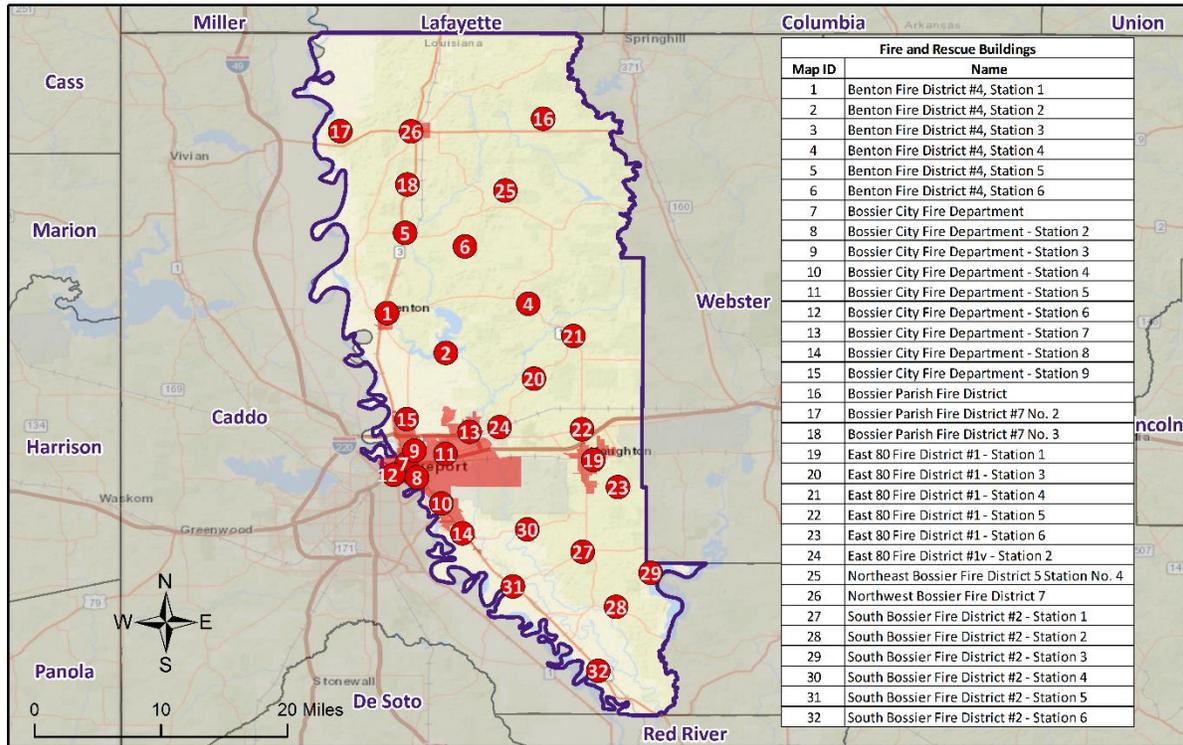


Figure 2-1: Fire and Rescue Facilities in Bossier Parish.

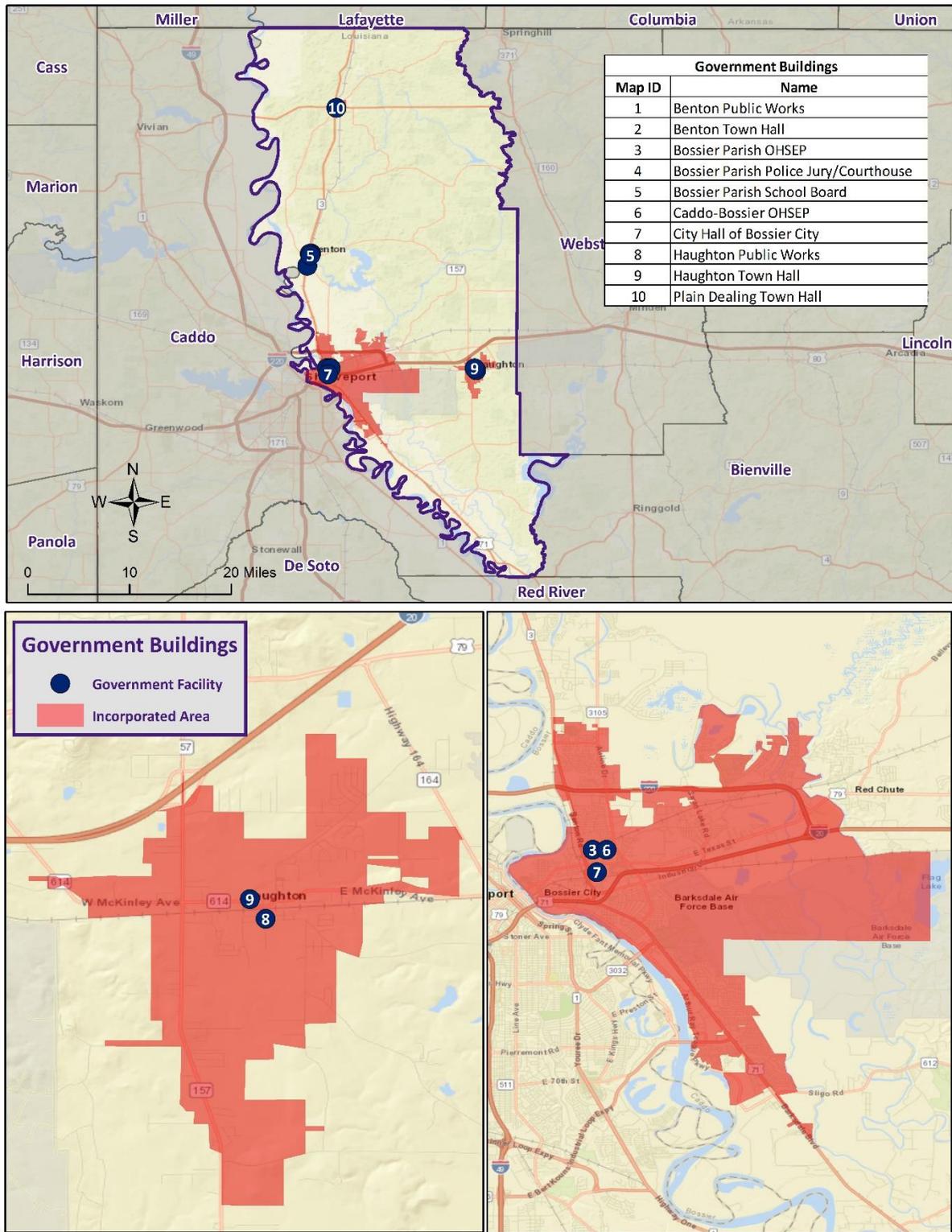


Figure 2-2: Government Facilities in Bossier Parish.

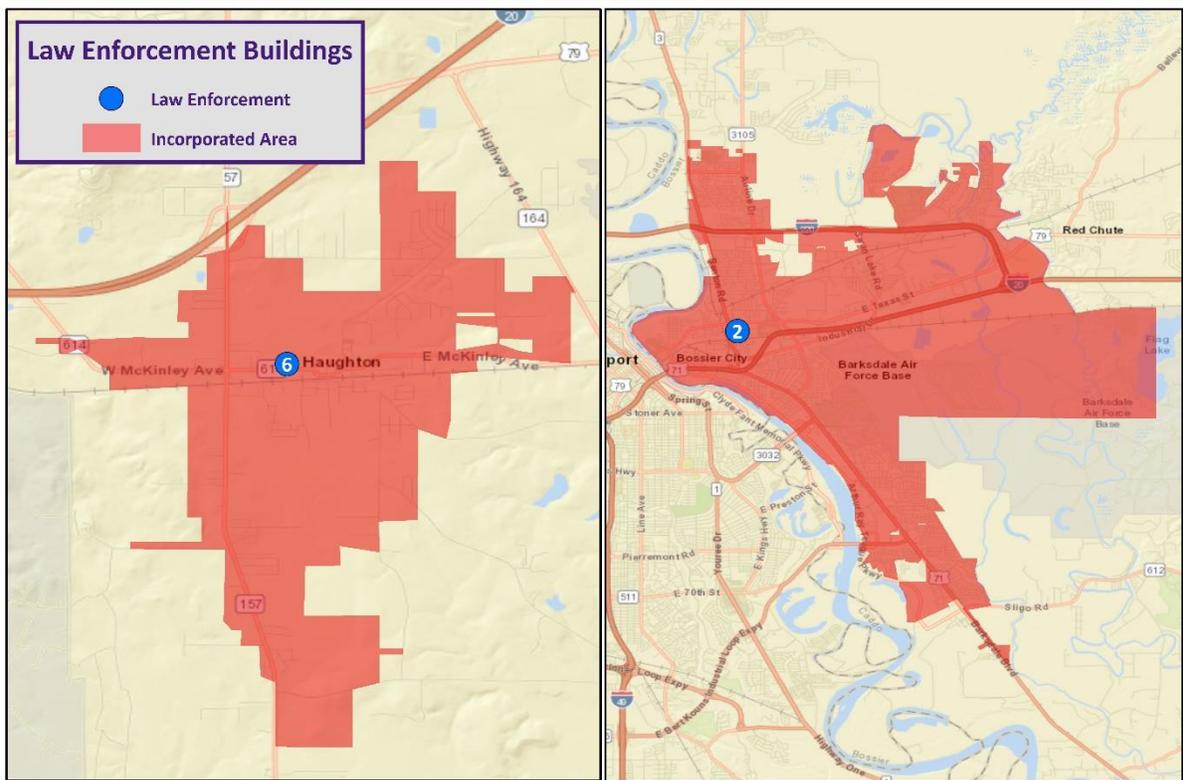
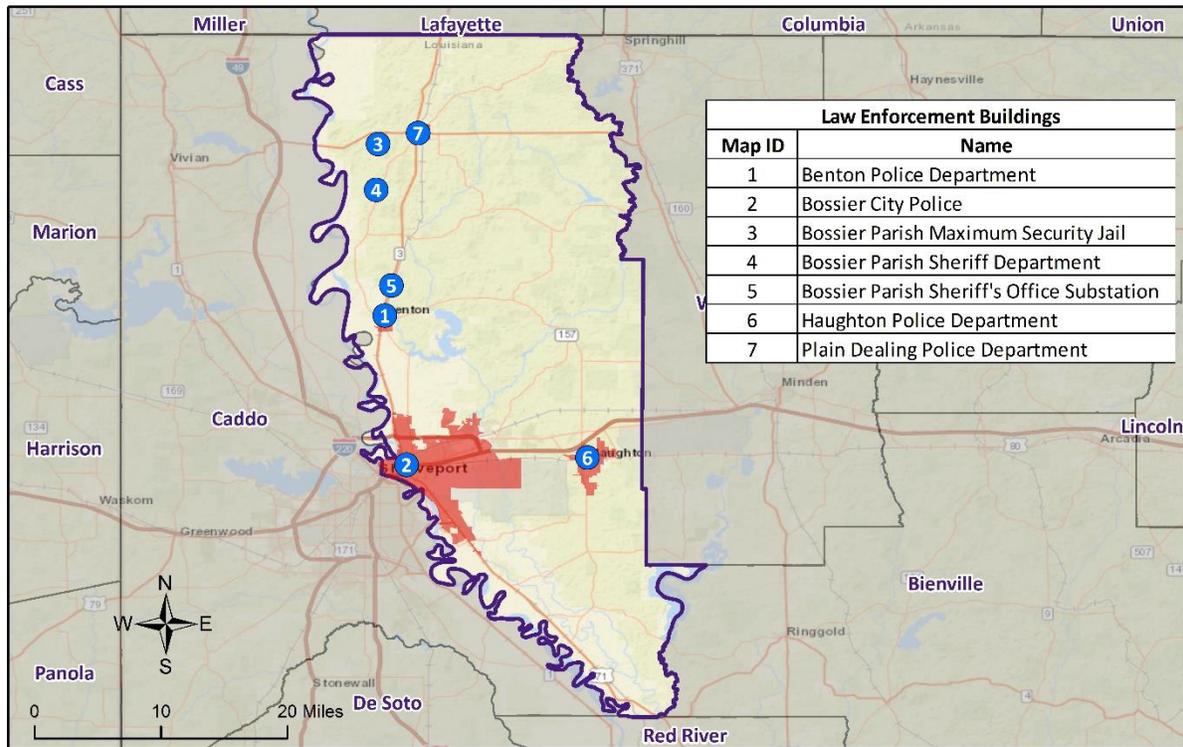


Figure 2-3: Law Enforcement Facilities in Bossier Parish.

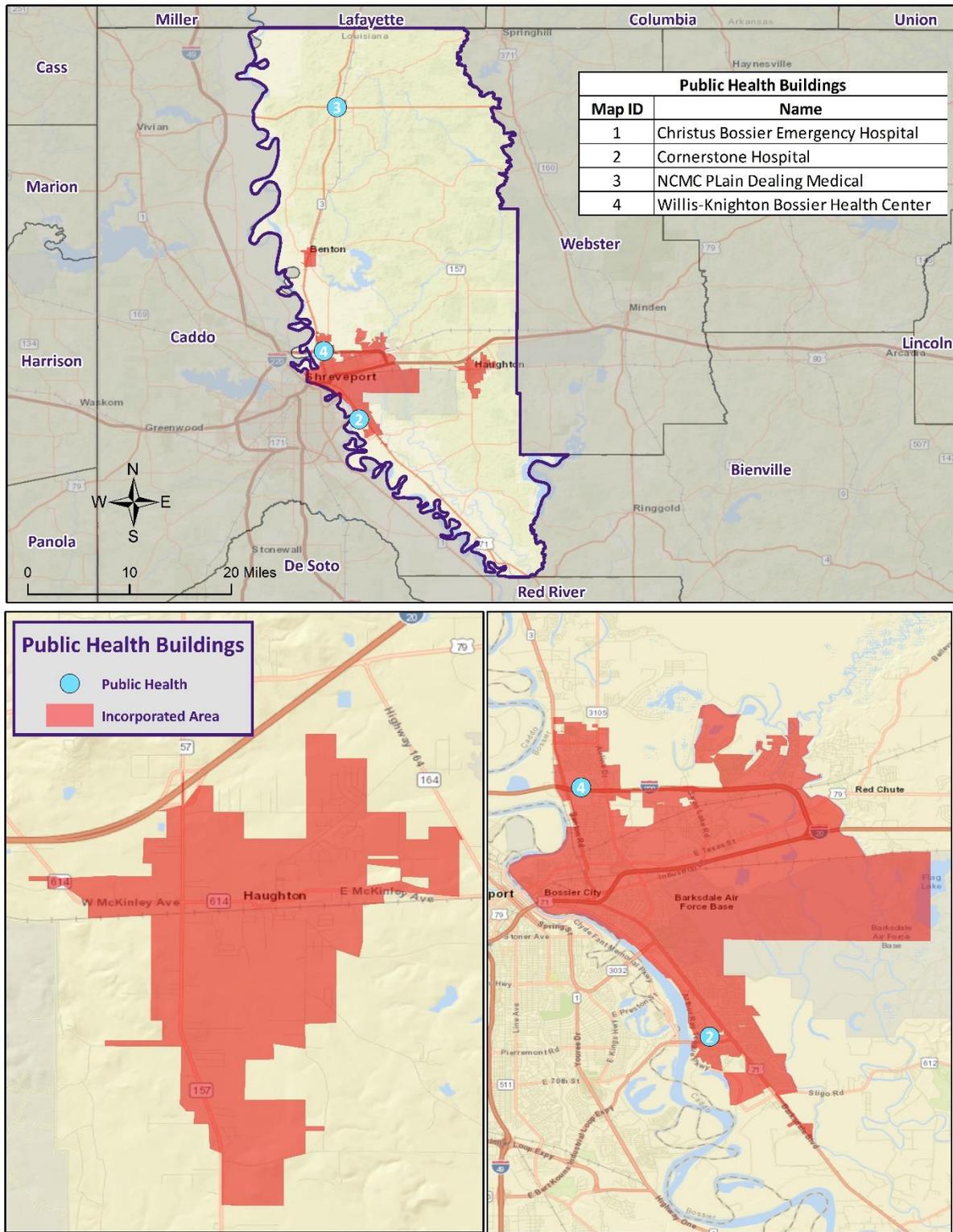


Figure 2-4: Public Health Facilities in Bossier Parish.

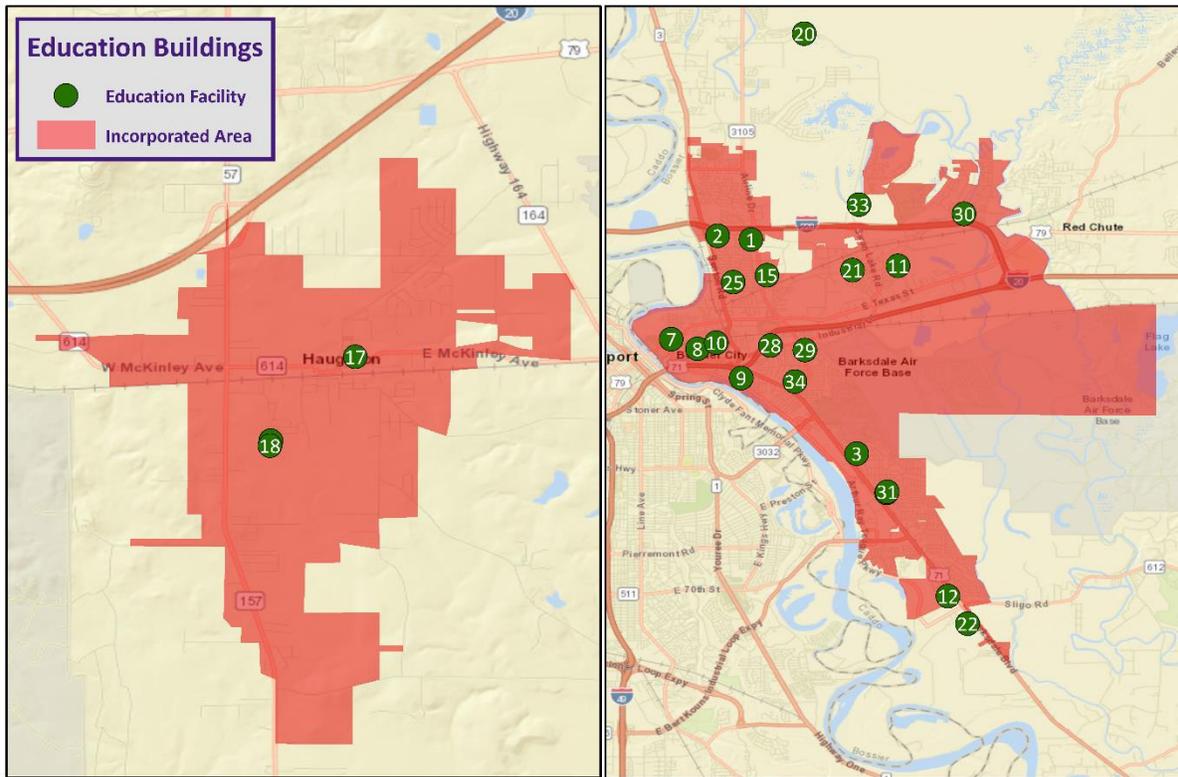
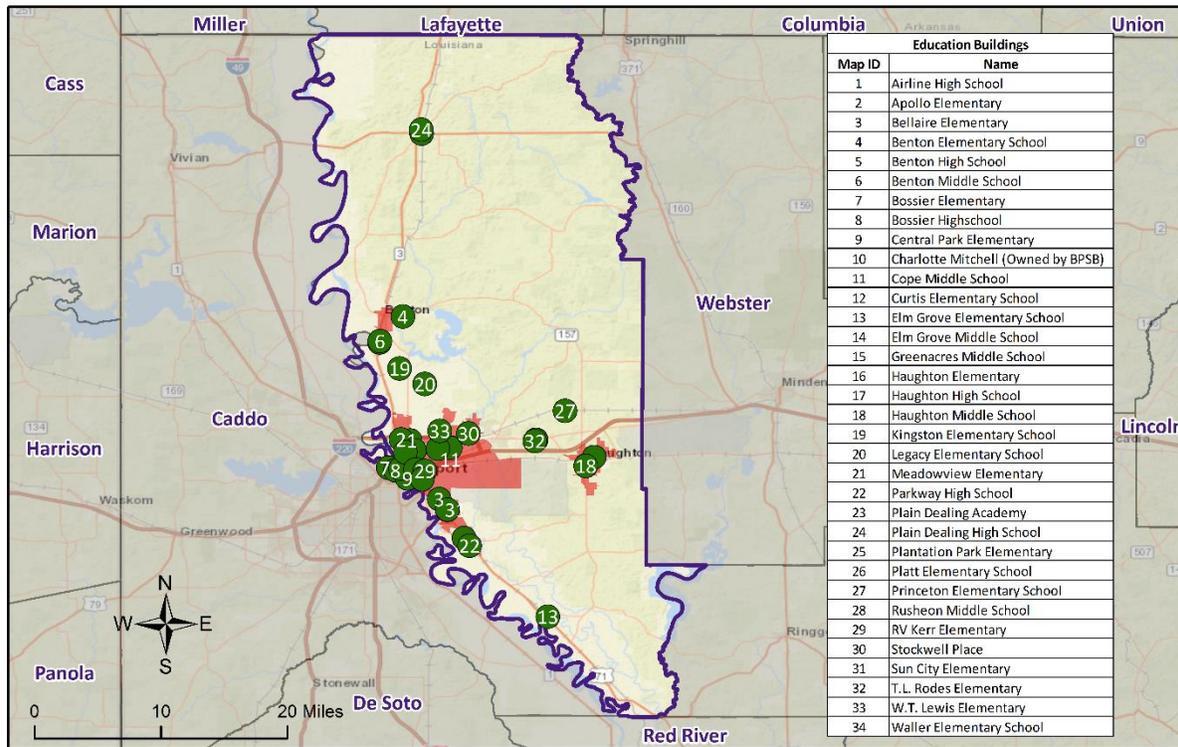


Figure 2-5: Educational Facilities in Bossier Parish.

## Assessing Vulnerability Overview

The purpose of assessing vulnerability is to quantify and/or qualify exposure and determine how various threats and hazards impact life, property, the environment, and critical operations in Bossier Parish. Vulnerability can be defined as the manifestation of the inherent states of the system (e.g., physical, technical, organizational, cultural) that can be exploited to adversely affect (cause harm or damage to) that system. For example, identifying areas in the parish that suffer disproportional damages from flooding compared with other areas, or overall exposure of an entire town to flooding. Identifying and understanding vulnerability to each threat and hazard provides a strong foundation for developing and pursuing mitigation actions.

The Vulnerability Assessment section for each hazard builds upon the information provided in the Risk Assessment by assessing the potential impact and amount of damage that each hazard has on the parish and each jurisdiction location. To complete the assessment, best available data were collected from a variety of sources, including local, state, and federal agencies, and multiple analyses were performed qualitatively and quantitatively. The estimates provided in the Vulnerability Assessment should be used to understand relative risk from each hazard and the potential losses that may be incurred; however, uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning specific hazards and their effects on the built environment, as well as incomplete datasets from approximations and simplifications that are necessary to provide a meaningful and complete analysis. Further, most datasets used in this assessment contain relatively short periods of records, which increases the uncertainty of any statistically based analysis.

## Quantitative Methodology

The quantitative methodology consists of utilizing a detailed GIS-based approach informed through the development of comprehensive hazard and infrastructure databases. This data-centric approach forms the foundation for our quantitative vulnerability assessment. GIS technology allowed for the identification and analysis of potentially at-risk community assets such as people and infrastructure. This analysis was completed for hazards that can be spatially defined in a meaningful manner (i.e., hazards with an official and scientifically determined geographic extent) and for which GIS data were readily available.

## Qualitative Methodology

The qualitative assessment relies less on technology, but more on historical and anecdotal data regarding expected hazard impacts. The qualitative assessment completed for Bossier Parish is based on the Priority Risk Index (PRI). The purpose of the PRI is to prioritize all potential hazards, and then group them into three categories of high, moderate, or low risk to identify and prioritize mitigation opportunities. The PRI is a good practice to use when prioritizing hazards because it provides a standardized numerical value for hazards to be compared. PRI scores were calculated using five categories:

- Probability
- Impact
- Spatial Extent
- Warning Time
- Duration

Each degree of risk is assigned a value (1-4) and a weighting factor. To calculate the Risk Factor for a given hazard, the assigned risk value for each category is multiplied by the weighted factor, and the sum of all six categories is totaled together to determine the final Risk Factor. The highest possible Risk Factor is 4.0.

$$\text{Risk Factor} = [(\text{Probability} * 0.25) + (\text{Impact} * 0.25) + (\text{Spatial Extent} * 0.20) + (\text{Warning Time} * 0.15) + (\text{Duration} * 0.15)]$$

### Priority Risk Index and Hazard Risk

Hazard risk is determined by calculating the Risk Factor for each hazard impacting Bossier Parish. A summary of the PRI is found in the following table. The conclusions drawn from the qualitative and quantitative assessments are fitted into three categories based on High, Moderate, or Low designations. Hazards identified as high risk have risk factors of 2.5 or greater. Risk Factors ranging from 2.0 to 2.4 are deemed moderate risk hazards. Hazards with Risk Factors less than 2.0 are considered low risk.

*Table 2-5: Summary of the Priority Risk Index.*

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	25%
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 100% probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	25%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than a week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self-explanatory	1	15%
	12 to 24 hours	Self-explanatory	2	
	6 to 12 hours	Self-explanatory	3	
	Less than 6 hours	Self-explanatory	4	
Duration	Less than 6 hours	Self-explanatory	1	15%
	Less than 24 hours	Self-explanatory	2	
	Less than one week	Self-explanatory	3	
	More than one week	Self-explanatory	4	

Table 2-6: Associated Risk Factor with PRI Value Range.

Risk Factor	PRI Range
High Risk	2.5 to 4.0
Moderate Risk	2.0 to 2.4
Low Risk	0 to 1.9

Table 2-7: Risk Assessment for Bossier Parish.

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	Overall Risk
Dam Failure	1	2	1	4	2	1.85
Drought	3	2	4	2	3	2.8
Flooding	4	4	3	4	3	3.65
Levee Failure	1	2	1	4	2	1.85
Thunderstorms - Hail	4	2	3	3	1	2.7
Thunderstorms - Lightning	3	2	2	3	1	2.25
Thunderstorms - Winds	4	2	3	3	1	2.7
Tornadoes	4	3	2	4	3	3.2
Tropical Cyclones	3	4	4	1	4	3.3
Wildfires	1	3	4	1	2	2.25
Winter Weather	3	2	2	4	2	2.55

### Socially Vulnerable Populations

The tables on the following pages illustrate socially vulnerable populations in Bossier Parish, and their respective jurisdictions, compared to the United States as a whole. Bossier Parish and their jurisdictions demonstrate above average percentage differences than that of the U.S. when dealing with socially vulnerable communities.

Based on the parish and their incorporated jurisdictions, reliability of the information presented becomes a factor. To combat misinformation and skewed values when dealing with socially vulnerable populations, the U.S. Census Bureau, along with Headwater Economics, has denoted values by color and given them a reliability denotation. Any values in **black** are denoted as “high reliability”. This means that error in data based off of the sampling size for that specific population is relatively small and should not be cause for concern. Any values in **orange** are denoted as “medium reliability”. This means that values could be skewed based off of the sampling size being inaccurately examined. Populations and values in orange should be interpreted with caution. Any values in **red** are denoted as “low reliability”. This means that population values and data taken from the census are very unreliable as the sample size included for this data incorporation were very small or insufficient. An emphasis has been placed on values in red in that any organization or company using them for studies, local plans and regulatory measures, or projects, should consult the respective community for a more comprehensive evaluation of said population(s). *Neighborhoods at Risk* also cites a data limitation to any community with less than 1,000 people residing in it. (US Census Beau 2021, Headwater Economics)

Additionally, there are limitations to the data that is provided on the following pages. Families in poverty are based upon the amount families within the identifiable area. Rental units, mobile homes, and households with no car are based upon the amount of housing units within the identifiable area. People who do not speak English well is based upon the population of the identifiable area who are five years of age or older. People without a high school degree are based upon the population of the identifiable area who are 25 years of age or older. All other indicators used to identify neighborhoods at risk are based upon the identifiable area's total population. For reference to populations with specific limitations, *Table 2-8* illustrates the population sample size used to evaluate their respective areas, not the total number of people a specific indicator applies to.

*Table 2-8: Limiting Factors of Social Vulnerability*

Limiting Factors in Neighborhoods at Risk – Population Sample Size (2021)						
Indicators 2021	Bossier Parish	Town of Benton	City of Bossier City	Town of Haughton	Town of Plain Dealing	United States
Families in poverty	31,496	615	14,880	151	193	80,755,759
Rental units, mobile homes, households with no car	47,849	885	24,185	1,386	372	124,010,992
People who do not speak English well	119,941	2,230	58,718	4,132	826	310,302,360
People without a high school degree	85,283	1,711	41,971	2,514	653	225,152,317
<b>Total Population</b>	<b>128,508</b>	<b>2,470</b>	<b>63,168</b>	<b>4,413</b>	<b>850</b>	<b>329,725,481</b>

*Table 2-9: Socially Vulnerable Populations in Bossier Parish*

Socially Vulnerable Populations – Bossier Parish				
Indicators 2021	Bossier Parish Population	Bossier Parish Percentage	U.S. Percentage	Percentage Difference (Bossier vs U.S.)
People under 5 years	8,567	6.7%	5.9%	13%
People over 65 years	18,133	14.1%	16.0%	-13%
People of color (including Hispanic)	44,934	35.0%	40.6%	-15%
People who do not speak English well	1,917	1.6%	4.1%	-88%
People without a high school degree	8,217	9.6%	11.1%	-14%
Families in poverty	4,097	13.0%	8.9%	37%
Housing units that are rentals	16,965	35.5%	35.4%	1%
Housing units that are mobile homes	5,450	11.4%	5.2%	75%
Households with no cars	2,539	5.3%	8.3%	-44%
People with disabilities	16,147	13.1%	12.6%	4%
People without health insurance	11,342	9.2%	8.5%	8%
<b>Population of Bossier Parish: 128,508</b>				

Table 2-10: Socially Vulnerable Populations in the Town of Benton

Socially Vulnerable Populations – Town of Benton				
Indicators 2021	Benton Population	Benton Percentage	U.S. Percentage	Percentage Difference (Benton vs U.S.)
People under 5 years	240	9.7%	5.9%	49%
People over 65 years	267	10.8%	16.0%	-39%
People of color (including Hispanic)	1,153	46.7%	40.6%	14%
People who do not speak English well	15	0.7%	4.1%	-142%
People without a high school degree	135	7.9%	11.1%	-34%
Families in poverty	615	12.2%	8.9%	31%
Housing units that are rentals	248	28.0%	35.4%	-23%
Housing units that are mobile homes	97	11.0%	5.2%	72%
Households with no cars	12	1.4%	8.3%	-142%
People with disabilities	441	17.9%	12.6%	35%
People without health insurance	167	6.8%	8.5%	22%
<b>Population of Benton: 2,470</b>				

Table 2-11: Socially Vulnerable Populations in the City of Bossier City

Socially Vulnerable Populations – City of Bossier City				
Indicators 2021	Bossier City Population	Bossier City Percentage	U.S. Percentage	Percentage Difference (Bossier City vs U.S.)
People under 5 years	4,450	7.0%	5.9%	17%
People over 65 years	9,137	14.5%	16.0%	-10%
People of color (including Hispanic)	27,488	43.5%	40.6%	7%
People who do not speak English well	1,670	2.8%	4.1%	-38%
People without a high school degree	4,953	11.8%	11.1%	6%
Families in poverty	2,320	15.6%	8.9%	55%
Housing units that are rentals	11,212	46.4%	35.4%	27%
Housing units that are mobile homes	682	2.8%	5.2%	-60%
Households with no cars	1,792	7.4%	8.3%	-11%
People with disabilities	8,717	14.7%	12.6%	15%
People without health insurance	6,326	10.7%	8.5%	23%
<b>Population of Bossier City: 63,168</b>				

Table 2-12: Socially Vulnerable Populations in the Town of Haughton

Socially Vulnerable Populations – Town of Haughton				
Indicators 2021	Haughton Population	Haughton Percentage	U.S. Percentage	Percentage Difference (Haughton vs U.S.)
People under 5 years	281	6.4%	5.9%	8%
People over 65 years	320	7.3%	16.0%	-75%
People of color (including Hispanic)	1,002	22.7%	40.6%	-57%
People who do not speak English well	0	0%	4.1%	-200%
People without a high school degree	238	9.5%	11.1%	-16%
Families in poverty	151	15.1%	8.9%	52%
Housing units that are rentals	306	22.1%	35.4%	-46%
Housing units that are mobile homes	418	30.2%	5.2%	141%
Households with no cars	32	2.3%	8.3%	-113%
People with disabilities	391	9.2%	12.6%	-31%
People without health insurance	200	4.7%	8.5%	-58%
Population of Haughton: 4,413				

Table 2-13: Socially Vulnerable Populations in the Town of Plain Dealing

Neighborhoods at Risk – Town of Plain Dealing				
Indicators 2021	Plain Dealing Population	Plain Dealing Percentage	U.S. Percentage	Percentage Difference (Plain Dealing vs U.S.)
People under 5 years	24	2.8%	5.9%	-3.1%
People over 65 years	231	27.2%	16.0%	11.2%
People of color (including Hispanic)	339	39.9%	40.6%	-0.7%
People who do not speak English well	0	0%	4.1%	-4.1%
People without a high school degree	69	10.6%	11.1%	-0.5%
Families in poverty	30	15.5%	8.9%	6.6%
Housing units that are rentals	136	36.6%	35.4%	1.2%
Housing units that are mobile homes	69	18.5%	5.2%	13.3%
Households with no cars	45	12.1%	8.3%	3.8%
People with disabilities	135	16.7%	12.6%	4.1%
People without health insurance	144	17.8%	8.5%	9.3%
Population of Plain Dealing: 850				

## Future Development Trends

Bossier Parish experienced a growth in population and housing between the years of 2000 and 2020, increasing in population from 99,658 with 40,286 housing units in the year 2000 to a population of 128,746 with 55,237 housing units in the year 2020. Haughton experienced the largest population growth within the parish growing from a populace of 3,470 in 2010 to 4,539 in 2020 (30.8% overall growth). This is followed by the unincorporated area of the parish at 18.4% overall growth, the incorporated area of Benton at 4.6% overall growth, and the incorporated area of Bossier City at 1.8% overall growth. The incorporated area of Plain Dealing experienced a decline in population during this same time period.

Haughton experienced the largest growth of housing units from 2010 to 2020 growing from 1,417 in 2010 to 1,863 in 2020. The unincorporated area of the parish experienced the second largest growth in housing units during this time period with a 16.4% overall growth rate, followed by the incorporated area of Benton with a 9.8% overall growth rate, and the incorporated area of Bossier City with a 7.6% overall growth rate. The incorporated area of Plain Dealing experienced a decline in housing units during this time. The future population and number of buildings can be estimated using U.S. Census Bureau housing and population data. The following tables show population and housing unit estimates from 2000 to 2020:

*Table 2-14: Population Growth Rate for Bossier Parish.*

Total Population	Bossier Parish	Unincorporated Area	Benton	Bossier City	Haughton	Plain Dealing
<b>1-Apr-00</b>	99,658	37,432	2,042	56,128	2,973	1,083
<b>1-Apr-10</b>	117,522	49,479	1,957	61,597	3,470	1,019
<b>1-Apr-20</b>	128,746	58,565	2,048	62,701	4,539	893
<b>Population Growth between 2000 – 2010</b>	17.9%	32.2%	-4.2%	9.7%	16.7%	-5.9%
<b>Average Annual Growth Rate between 2000 – 2010</b>	1.8%	3.2%	-0.4%	1.0%	1.7%	-0.6%
<b>Population Growth between 2010 – 2020</b>	9.6%	18.4%	4.6%	1.8%	30.8%	-12.4%
<b>Average Annual Growth Rate between 2010 – 2020</b>	0.96%	1.84%	0.46%	0.18%	3.08%	-1.24%

Table 2-15: Housing Growth Rate for Bossier Parish.

Total Housing Units	Bossier Parish	Unincorporated Area	Benton	Bossier City	Haughton	Plain Dealing
1-Apr-00	40,286	14,762	834	23,027	1,169	494
1-Apr-10	49,351	21,004	856	25,579	1,417	495
1-Apr-20	55,237	24,455	940	27,522	1,863	457
Housing Growth between 2000 – 2010	22.5%	42.3%	2.6%	11.1%	21.2%	0.2%
Average Annual Growth Rate between 2000 – 2010	2.3%	4.2%	0.3%	1.1%	2.1%	0.0%
Housing Growth between 2010 – 2020	11.9%	16.4%	9.8%	7.6%	31.5%	-7.7%
Average Annual Growth Rate between 2010 – 2020	1.2%	1.6%	1.0%	0.8%	3.1%	-0.8%

### Future Hazard Impacts

Hazard impacts were estimated for five years and ten years in the future (2025 and 2030). Yearly population and housing growth rates were applied to parish inventory assets for composite flood and tropical cyclones. Based on a review of available information, it is assumed that population and housing units will grow within Bossier Parish from the present until 2030. A summary of estimated future impacts is shown in the table below. Dollar values are expressed in future costs and assume an annual rate of inflation of 1.02%.

Table 2-16: Estimated Future Impacts, 2020 - 2030.

(Source: Hazus, US Census Bureau)

Hazard / Impact	Total in Parish (2020)	Hazard Area (2020)	Hazard Area (2025)	Hazard Area (2030)
<b>Flood Damage</b>				
Structures	55,896	9,307	9,876	10,356
Value of Structures	\$18,575,552,837	\$3,093,087,954	\$3,452,825,273	\$3,770,513,218
# of People	129,976	21,643	22,696	23,576
<b>Tropical Cyclone Damage</b>				
Structures	55,896	55,896	59,310	62,190
Value of Structures	\$18,575,552,837	\$18,575,552,837	\$20,735,956,832	\$22,643,833,133
# of People	129,976	129,976	136,302	141,584

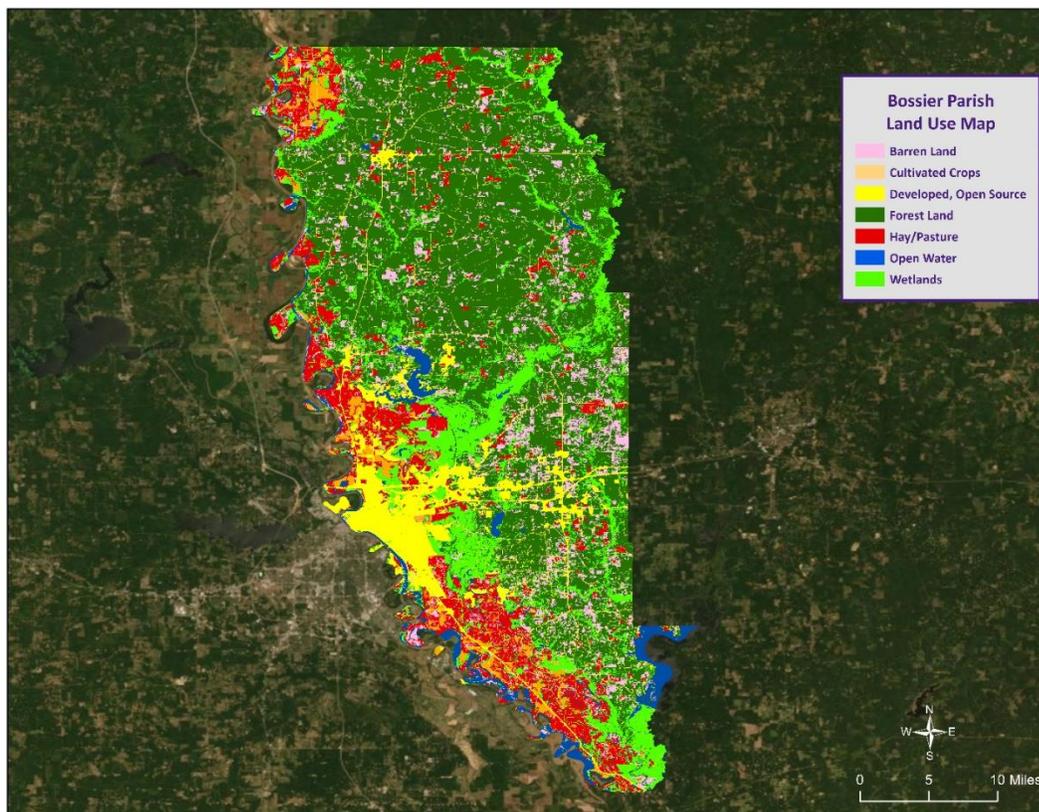
Aside from the Town of Plain Dealing where numbers have declined, both population and housing numbers have increased relatively significantly throughout the parish since the last update to the Bossier Parish Hazard Mitigation Plan. With that in mind, Bossier Parish has been vigilant in offsetting any new development around the parish with appropriate mitigative actions. Initiatives such as active floodplain management have regulated the development of flood prone areas to continue supporting and encouraging safer communities within Bossier Parish. The development that has occurred since 2017 has not in any knowing way altered the parish's vulnerability to natural hazards.

## Land Use

The Bossier Parish Land Use table is provided below. Residential, commercial, and industrial areas account for only 9% of the parish's land use. Forested land at 267,957 acres is the largest category accounting for 48% of land in the parish. The parish also consists of agricultural land (24%), wetlands (15%), and water areas (4%).

*Table 2-17: Bossier Parish Land Use.  
(Source: USGS Land Use Map)*

Land Use	Acres	Percentage
<b>Agricultural Land, Cropland, and Pasture</b>	130,991	24%
<b>Wetlands</b>	80,950	15%
<b>Forest Land (Not including forested wetlands)</b>	267,957	48%
<b>Urban/Development</b>	51,888	9%
<b>Water</b>	21,266	4%



*Figure 2-6: Bossier Parish Land Use Map.  
(Source: USGS Land Use Map)*

## Hazard Identification

### Dam Failure

Dams are water storage, control, or diversion barriers that impound water upstream and in reservoirs. Dams are a vital part of our nation's infrastructure, providing drinking water, flood protection, renewable hydroelectric power, navigation, irrigation, and recreation. These critical daily benefits are also inextricably linked to the potential harmful consequences of a dam failure.

Dam failure is a collapse or breach in a structure. A dam failure can result in severe loss of life, economic disaster, and extensive environmental damage. While most dams have storage volumes small enough that failures have few repercussions, dams with large storage volumes can cause significant flooding downstream. Dam failures often have a rapid rate of onset, leaving little time for evacuation. The first signs of the failure may go unnoticed upon visual inspection of the dam structure. However, continual maintenance and inspection of dams often provide the opportunity to identify possible deficiencies in their earlier stages and can prevent a possible catastrophic failure event.

The duration of the flooding event caused by the failure depends largely on the amount of water and downstream topography. Given smaller volumes of water and topography suited for transporting the water rapidly downstream, the event may only last hours. Because of the lack of seasonality and other predictive factors, a predictive frequency or likelihood of dam failures cannot be determined. However, the National Dam Safety Program (NDPS) produces hazard rankings (high, significant, and low) and definitions of dam structures, based on potential impact. These rankings can be defined as the following:

- **High:** Dams assigned the high hazard potential classification are those where failure or mis operation will probably cause loss of human life.
- **Significant:** Dams assigned the significant hazard potential classification are those dams where failure or mis operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominately rural or agricultural areas, but could be located in areas with population and significant infrastructure.
- **Low:** Dams assigned the low hazard potential classification are those where failure or mis operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

Dam/reservoir failures can result from any one of or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which cause most failures.
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross-section of the dam and abutments, or maintain gates, valves, and other operational components;
- Improper design, including the use of improper construction materials and construction practices;
- Negligent operation, including failure to remove or open gates or valves during high flow periods;
- Failure of upstream dams on the same waterway;
- Landslides into reservoirs, which cause surges that result in overtopping;
- High winds, which can cause significant wave action and result in substantial erosion; and
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments that can weaken entire structures.

In Louisiana, there are 513 dams included in the Army Corps of Engineers National Inventory of Dams. Of these, 41 are considered high hazard, 63 are significant hazard, and 409 are low hazard potential dams.

#### Location

According to the National Inventory of Dams, Bossier Parish has eight high hazard dams located in the unincorporated area of Bossier Parish and near Plain Dealing. Dam hazards pose no threat to the incorporated areas of Benton, Bossier City, and Haughton. The areas of inundation will generally be directly downstream of the dam and the low-lying areas surrounding the area of dam failure, but a working group will be established to determine the specific locations of inundation. The actions for a dam failure working group can be found in *Section 4: Mitigation Strategy*. The dams located in Bossier Parish are shown in the following figure:

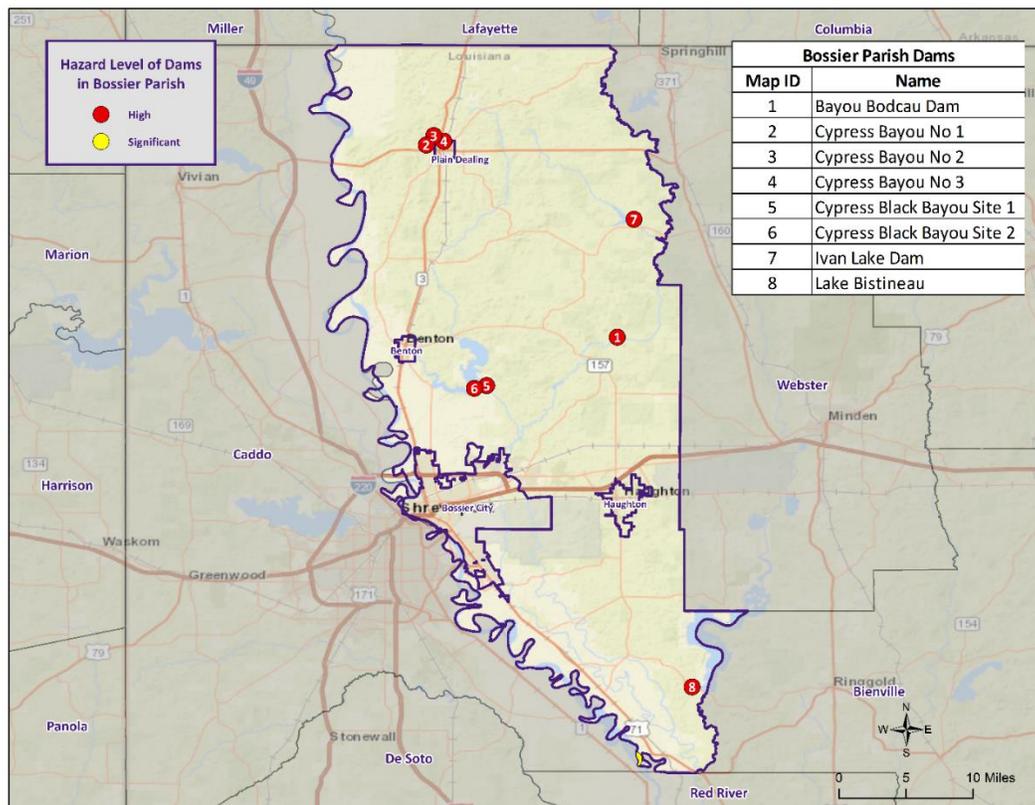


Figure 2-7: National Inventory of Dam Locations in Bossier Parish.

#### Previous Occurrences / Extents

The National Performance of Dams Program (NPDP), a database of dam incidents maintained by Stanford University, lists one dam incident in Louisiana, which occurred in Kisatchie Lake Dam in Grant Parish in 1991. However, there have been no dam failures within the boundaries of Franklin Parish and its jurisdictions. The parish claims a data deficiency on the extent of dam failure for the eight high hazard dams in Bossier Parish. Bossier Parish will continue to develop an extent for these dams.

#### Frequency / Probability

It is nearly impossible to predict and model dam failure and its impacts on Bossier Parish. Due to the unpredictability of dam failures, it is calculated that the probability of a dam failure is less than 1% annually for the unincorporated areas of Franklin Parish and its jurisdictions.

### *Estimated Potential Losses*

Determining the annualized loss as a result of a dam failure is difficult in Bossier Parish due to availability of data on past dam failure events. The National Inventory of Dams was utilized to determine the dams within Bossier Parish, the risk level, and storage capacity of the reservoir. The NLD is a congressional authorized database that documents dams in the United States and its territories and is maintained by the U.S. Army Corps of Engineers (USACE). The following table provides an extensive list of the dams in Bossier Parish with the risk associated with each system.

*Table 2-18: Dams and Risk Associated with each in Bossier Parish.  
(Source: National Inventory of Dams)*

System	Rating	Height (ft)	Storage (Acre-Feet)	Dam Type	Last Inspection Date
<b>Bayou Bodcau Dam</b>	High	76	1,197,700	Earth	4/10/2021
<b>Cypress Bayou No 1</b>	High	53	2,400	Earth	6/9/2020
<b>Cypress Bayou No 2</b>	High	43	2,450	Earth	3/4/2019
<b>Cypress Bayou No 3</b>	High	32	405	Earth	6/9/2020
<b>Cypress Black Bayou Site 1</b>	High	49	77,000	Earth	9/21/2020
<b>Cypress Black Bayou Site 2</b>	High	41	18,000	Earth	9/21/2020
<b>Ivan Lake Dam</b>	High	35	7,800	Earth	7/7/2020
<b>Lake Bistineau</b>	High	46	318,000	Earth	7/17/2020

### *Impacts of Climate Change*

Extreme precipitation, primarily the type that contributes to flash flooding and not widespread areal flooding, is expected to increase due to climate change in Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing. While this may not contribute to the traditional definition of a dam failure, it could increase the chances of a dam overtopping.

Climate change disproportionately affects vulnerable populations, including those living in low-lying areas, impoverished communities, and areas with inadequate infrastructure. Dam failures can have severe consequences for these populations leading to loss of life, displacement, and the destruction of homes, livelihoods, and critical infrastructure such as water supply systems and power generation facilities. Vulnerable populations may lack the resources or means to respond effectively to dam failures or cope with their aftermath, exacerbating the impact of climate change on their lives and well-being.

To address these challenges, it is essential to incorporate climate change considerations into dam design, construction, maintenance practices, and future land use plans. This includes assessing the potential impacts of climate change on dam safety, implementing adaptive measures to strengthen dam infrastructure, and developing early warning systems to ensure the timely evacuation and protection of vulnerable populations in the event of a dam failure.

### *Vulnerability*

See [Appendix C](#) for parish and municipality building exposure to dam failures.

## Drought

A drought is a deficiency in water availability over an extended period of time, caused by precipitation totals and soil water storages that do not satisfy the environmental demand for water, either by evaporation or transpiration through plant leaves. It is important to note that the lack of precipitation alone does not constitute drought; the season during which the precipitation is lacking has a major impact on whether drought occurs. For example, a week of no precipitation in July, when the solar energy to evaporate water and vegetation's need for water to carry on photosynthesis are both high, may trigger a drought, while a week of no precipitation in January may not initiate a drought.

Drought is a unique and insidious hazard. Unlike other natural hazards, no specific threshold of "dryness" exists for declaring a drought. In addition, the definition of drought depends on stakeholder needs. For instance, the onset (and demise) of agricultural drought is quick, as crops need water every few days; once they get rainfall, they improve. But hydrologic drought sets in (and is alleviated) only over longer time periods. A few dry days will not drain a reservoir, but a few rain showers cannot replenish it either. Moreover, different geographical regions define drought differently based on the deviation from local, normal precipitation. And drought can occur anywhere, triggered by changes in the local-to-regional-scale atmospheric circulation over an area, or by broader-scale circulation variations such as the expansion of semi-permanent oceanic high-pressure systems or the stalling of an upper-level atmospheric ridge in place over a region. The severity of a drought depends upon the degree and duration of moisture deficiency, as well as the size of the affected area. Periods of drought also tend to be associated with other hazards, such as wildfires and/or heat waves. Lastly, drought is a slow onset event, causing less direct—but tremendous indirect—damage. Depletion of aquifers, crop loss, and livestock and wildlife mortality rates are examples of direct impacts. Since the groundwater found in aquifers is the source of about 38% of all county and city water supplied to households (and comprises 97% of the water for all rural populations that are not already supplied by cities and counties), droughts can potentially have direct, disastrous effects on human populations. The indirect consequences of drought, such as unemployment, reduced tax revenues, increased food prices, reduced outdoor recreation opportunities, higher energy costs as water levels in reservoirs decrease and consumption increases, and water rationing, are not often fully known. This complex web of impacts causes drought to affect people and economies well beyond the area physically experiencing the drought.

This hazard is often measured using the Palmer Drought Severity Index (PDSI, also known operationally as the Palmer Drought Index). The PDSI, first developed by Wayne Palmer in a 1965 paper for the U.S. Weather Bureau, measures drought through recent precipitation and temperature data with regard to a basic supply-and-demand model of soil moisture. It is most effective in long-term calculations. Three other indices used to measure drought are the Palmer Hydrologic Drought Index (PHDI), the Crop Moisture Index (CMI), which is derived from the PDSI, and the Keetch-Byram Drought Index (KBDI), created by John Keetch and George Byram in 1968 for the U.S. Forest Service. The KBDI is used mainly for predicting the likelihood of wildfire outbreaks. As a compromise, the PDSI is used most often for droughts since it is a medium-response drought indicator. The objective of the PDSI is to provide measurements of moisture conditions that are standardized so that comparisons using the index can be made between locations and between months.

Table 2-19 displays the range and Palmer classifications of the PDSI index while Figure 2-8 displays the current drought monitor for the state of Louisiana and its parishes.

Table 2-19: Palmer Drought Severity Index Classification and Range

Range	Palmer Classifications
4.0 or more	Extremely Wet
3.0 to 3.9	Very Wet
2.0 to 2.9	Moderately Wet
1.0 to 1.99	Slightly Wet
0.5 to 0.99	Incipient Wet Spell
0.49 to -0.49	Near Normal
-0.5 to -0.99	Incipient Dry Spell
-1.0 to -1.99	Mild Drought
-2.0 to -2.99	Moderate Drought
-3.0 to -3.99	Severe Drought
-4.0 or less	Extreme Drought

The PDSI best measures the duration and intensity of drought-inducing circulation patterns at a somewhat long-term time scale, although not as long-term as the PHDI. Long-term drought is cumulative, so the intensity of drought during the current month is dependent on the current weather patterns in addition to the effects of cumulative patterns of previous months. Although weather patterns can change almost overnight from a long-term drought pattern to a long-term wet pattern, as a medium-response indicator, the PDSI responds relatively rapidly. Data compiled by the National Drought Mitigation Center indicates extreme drought conditions in the central portion of the parish and severe drought conditions in the north and south portions of the parish.

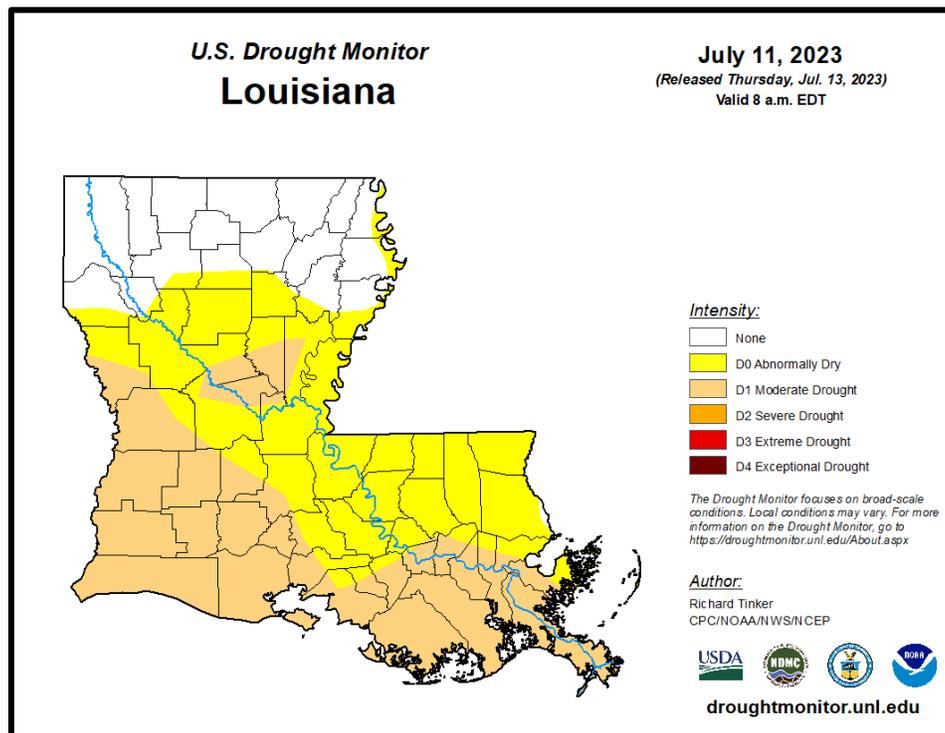


Figure 2-8: United States Drought Monitor for the State of Louisiana and its Parishes.  
(Source: The National Drought Mitigation Center)

*Location*

Drought typically impacts a region and not one specific parish or jurisdiction. While the entire planning area can experience drought, the major impact of a drought event in Bossier Parish is on the agricultural community. However, droughts do have the potential to reduce the stability of soil leading to shifting structures and damage to foundations. The worst-case drought scenario for Bossier Parish would be a severe drought (D3).

*Previous Occurrences / Extent*

Historically, there have been 11 drought incidents in Bossier Parish. Drought events have ranged from Mild to Extreme per the National Climatic Data Center. Since the last update in 2017, there have been three drought events within the boundaries of Bossier Parish.

Table 2-20: Historical Droughts in Bossier Parish since the 2017 Update.

Date	Impacts	Crop Damage	Magnitude
<b>November 2017 – February 2018</b>	Severe (D2) drought conditions present across much of North Louisiana during December continued through the entire month of January, as below normal rainfall again was observed across much of this area. Monthly rainfall amounts ranged from just under 1.50 inches to around 3.00 inches, with the lower amounts having fallen across much of Caddo and Bossier Parishes. In fact, Shreveport ranked as having the 16th driest January on record with just 1.41 inches recorded, which was 2.79 inches below normal. The continued dry conditions since September resulted in hydrological impacts being felt across much of this area, with low stream flows reported across many rivers and their tributaries.	\$0	D2
<b>June – September 2018</b>	Extreme (D3) drought continued across Northern Bossier, much of Webster, Northern Bienville, and Southwest Claiborne Parishes to start the month of September, while severe (D2) drought conditions encompassed the remainder of these parishes. However, scattered showers and thunderstorms increased in coverage between September 3rd-11th across these areas, ahead of a weak surface frontal system that pulled up stationary across portions of East Texas and North Louisiana. Widespread rainfall amounts of 1.50-3.00+ inches fell across much of these areas, resulting in slow improvements in drought across portions of this area by the September 13th issuance of the U.S. Drought Monitor. Additional heavy rainfall of 3.00-6.00 inches that fell during the final two weeks of September eliminated drought conditions across much of North Louisiana, as short and long term moisture deficits had completely recovered.	\$0	D3
<b>September – October 2019</b>	Severe drought (D2) conditions continued across portions of Northwest Louisiana (including much of Caddo and Bossier Parishes) through much of October, with near record heat in the mid and upper 90s persisting across the area through the	\$0	D2

Date	Impacts	Crop Damage	Magnitude
	6th. A series of cold fronts did focus periods of scattered showers and thunderstorms over Northwest Louisiana throughout the month, with the heaviest rain falling on the 25th where widespread amounts of one to in excess of two inches was recorded. Given this rain, and the cumulative totals of five to eight inches observed throughout October, drought conditions improved one to two categories to abnormally dry (D0) by the end of the month across much of Caddo and Bossier Parishes, as a period of much below normal temperatures set in for the first half of November.		

#### *Frequency / Probability*

Based on four drought events since 1990, the annual chance of occurrence of a drought event occurring within a given year is calculated at 36% for Bossier Parish.

#### *Estimated Potential Loses*

According to the NCEI Storm Events Database, there have been four drought events which have impacted Bossier Parish which resulted in \$75,000 in damage to crops in the parish. When examining the drought hazard, the main impact will primarily be on the crops. The following table presents an analysis of agricultural exposure which are susceptible to droughts by type for Bossier Parish.

*Table 2-21: Agricultural Exposure by Crop Type for Droughts in Bossier Parish.  
(Source: LSU AG Center 2020 Parish Totals)*

Agricultural Exposure by Type for Drought					
Corn	Cotton	Hay	Forestry	Soybeans	Wheat
\$2,665,212	\$1,211,213	\$3,819,211	\$19,693,094	\$3,922,194	\$932,044

There have been no reported injuries or deaths as a direct result of drought in Bossier Parish.

#### *Impacts of Climate Change*

Climate change is expected to increase the number and intensity of droughts in Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing. Drought can be caused by both a reduction in precipitation, as well as by heat that results in increased evaporation. Changes in temperature and types of precipitation in the state of Louisiana will affect drought characteristics. An increase in rain and a decrease in winter weather events with increased temperatures will cause peak streamflow to occur earlier in the year. This change in the hydrologic cycle will have significant impacts on natural systems in Louisiana including the intensity, duration, and frequency of droughts.

The National Risk Index (NRI) includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the parish and Census tract level. The table on the next page provides an overview of each category at the parish level for drought.

*Table 2-22: National Risk Index (NRI) Summarization of Drought Occurrences for the Parish  
(Source: National Risk Index)*

<b>Expected Annual Losses</b>	<b>Overall Risk Rating</b>
Relatively Low	Relatively Low

Drought-induced water scarcity and agricultural failures can lead to population displacement. When water and food resources become scarce, vulnerable communities may be forced to migrate to areas with more favorable conditions, which can lead to increased competition and conflicts over limited resources. Displacement also puts additional strains on host communities, exacerbating social, economic, and political tensions.

Droughts associated with climate change can have adverse health effects on vulnerable populations. Water scarcity and poor sanitation conditions can increase the risk of waterborne diseases, such as diarrhea and cholera. Droughts can also lead to malnutrition, as food supplies become scarce, and prices rise. Moreover, the stress and anxiety caused by prolonged droughts can have detrimental effects on mental health within vulnerable communities.

Addressing the impacts of climate change on drought and vulnerable populations requires a multi-faceted approach. This includes implementing sustainable water management practices, promoting drought-resistant agricultural techniques, improving early warning systems for droughts, supporting vulnerable communities with access to clean water and food, examining future land use patterns, and implementing climate adaptation strategies that enhance resilience and reduce vulnerability to drought events.

#### *Vulnerability*

See [Appendix C](#) for parish and municipality buildings that are susceptible to drought.

## Earthquakes

An earthquake is a sudden motion or trembling of the Earth caused by an abrupt release of stored energy in the rocks beneath the Earth's surface. The energy released results in vibrations which are known as seismic waves. Ground motion from seismic waves is expressed as peak ground acceleration (PGA), the fastest measured change in speed for a particle at ground level that is moving because of an earthquake. PGA is commonly measured as a percentage of acceleration due to Earth's gravity (%g). This measurement is relied upon to determine seismic load engineering design and construction requirements. Earthquakes are typically described in terms of magnitude and intensity. Magnitude is the measure of the amplitude of the seismic wave and is often expressed by the Richter scale, and intensity is a measure of how strong the shock was felt at a particular location, indexed by the Modified Mercalli Intensity (MMI) scale. The Richter scale is a logarithmic measurement whereby an increase in the scale by one whole number represents a tenfold increase in measured ground motion of the earthquake (and an increase in energy released of more than 30 times). An increase by two whole numbers represents a 102 (or 100-fold) increase in ground motion, and thus more than 302 (or 900) times the energy released. The following table shows the rough correlation between the Richter scale, PGA, and the MMI. The relationship between these is approximate and depends upon such specifics as the depth of the focus (the location of the actual rock movement) and distance from the epicenter (the location on the Earth's surface above the earthquake focus) of the earthquake.

*Table 2-23: Comparison of Earthquake Magnitudes for PGA, Richter, and MMI  
(Source: USGS Earthquake Hazards Program)*

Comparison of Earthquake Metrics			
PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
<0.17	1.0 - 3.0	I	I. Not felt except by a very few under especially favorable conditions.
0.17 - 1.4	3.0 - 3.9	II - III	II. Felt only by a few persons at rest, especially on upper floors of buildings. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
1.4 - 9.2	4.0 - 4.9	IV - V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rock noticeably. V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
9.2 - 34	5.0 - 5.9	VI - VII	VI. Felt by all. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

Comparison of Earthquake Metrics			
PGA (%g)	Magnitude (Richter)	Intensity (MMI)	Description (MMI)
34 - 124	6.0 - 6.9	VII - IX	<p><b>VIII.</b> Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned.</p> <p><b>IX.</b> Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.</p>
>124	7.0 and higher	VIII or higher	<p><b>X.</b> Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.</p> <p><b>XI.</b> Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.</p> <p><b>XII.</b> Damage total. Lines of sight and level are distorted. Objects thrown into the air.</p>

The system of subsidence faults in southern Louisiana developed due to accelerated land subsidence and rapid sediment deposition from the Mississippi River. The system stretches across the southern portion of the state from Beauregard Parish in the west to West Baton Rouge Parish in the east and it includes every parish south of this line. This system is thought to be responsible for many of the recorded earthquakes from 1843 to the present. All the earthquakes that occurred over this period of time were of low magnitude, resulting mostly in limited property damage (such as broken windows, damaged chimneys, and cracked plaster). While faults throughout the northwestern parishes are thought to be inactive, the New Madrid seismic zone lies just to the north of Louisiana and originates in the region of New Madrid, Missouri. The magnitude of historic earthquakes originating in the New Madrid seismic zone is far greater than that generated by the subsidence fault system in coastal Louisiana. A significant seismic event from the New Madrid seismic zone is more likely to have a greater impact on Louisiana than a seismic event from the subsidence fault system.

#### *Location*

An earthquake event is a geological hazard that occurs along fault lines. Bossier Parish has one fault line running through the far northwestern section of the parish. Effects of an earthquake may be felt throughout the parish.

#### *Previous Occurrences / Extents*

Per the NCEI database, there have been no earthquake events occurring within the boundaries of Bossier Parish between the years of 1990 to 2021. However, the National Oceanic and Atmospheric Administration's National Geophysical Data Center reports one earthquake event occurring within the boundaries of Bossier Parish between the years 1811 – 2021. Based on the previous earthquake event presented in the following table, an earthquake with an intensity level of MMI 4 could occur within the planning area. This intensity of an earthquake would be felt by many people indoors, but by a few who are outdoors.

Table 2-24: Summary of Earthquakes in Bossier Parish.

Date	Location	Intensity (MMI)
May 19, 1957	Benton	4

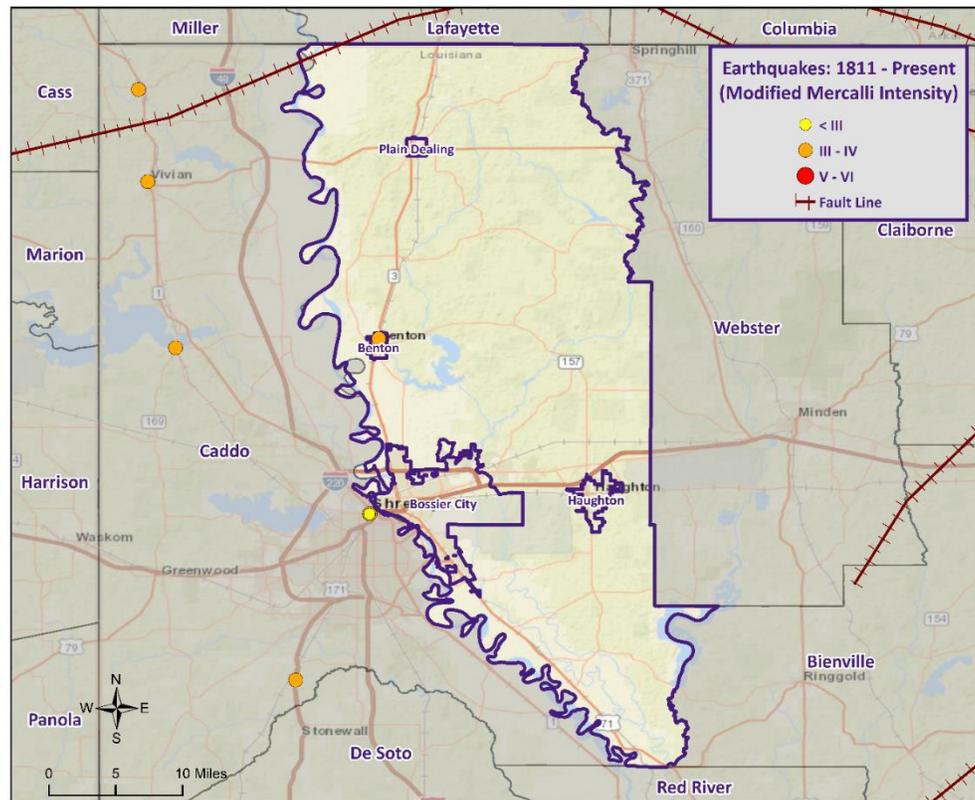


Figure 2-9: Location and Intensity (MMI) of Earthquakes in Bossier Parish

#### Frequency / Probability

Earthquakes are an extremely rare occurrence in the State of Louisiana and Bossier Parish, with one occurrence of an earthquake event within the boundaries of the parish from the years 1811 – 2021. Based on this historical record and Louisiana’s State Hazard Mitigation Plan, it is determined that an earthquake event has less than a 1% annual chance of occurrence in the Bossier Parish planning area and they have no impact on the parish. As a result, earthquakes are discounted and not carried forward into risk assessment.

## Flooding

A flood is the overflow of water onto land that is usually not inundated. The National Flood Insurance Program defines a flood as:

A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from overflow of inland or tidal waves, unusual and rapid accumulation or runoff of surface waters from any source, mudflow, or collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Factors influencing the type and severity of flooding include natural variables such as precipitation, topography, vegetation, soil texture, and seasonality, as well as anthropogenic factors such as urbanization (extent of impervious surfaces), land use (agricultural and forestry tend to remove native vegetation and accelerate soil erosion), and the presence of flood-control structures such as levees and dams.

Excess precipitation, produced from thunderstorms or hurricanes, is often the major initiating condition for flooding, and Louisiana can have high rainfall totals at any time of day or year. During the cooler months, slow-moving frontal weather systems produce heavy rainfalls, while the summer and autumn seasons produce major precipitation in isolated thunderstorm events (often on warm afternoons) that may lead to localized flooding. During these warmer seasons, floods are overwhelmingly of the flash flood variety, as opposed to the slower-developing river floods caused by heavy stream flow during the cooler months.

In cooler months, particularly in the spring, Louisiana is in peak season for severe thunderstorms. The fronts that cause these thunderstorms often stall while passing over the state, occasionally producing rainfall totals exceeding ten inches within a period of a few days. Since soil tends to be nearly saturated at this time (due to relatively low overall evaporation rates), spring typically becomes the period of maximum stream flow across the state. Together, these characteristics increase the potential for high water, with low-lying, poorly drained areas being particularly susceptible to flooding during these months.

In Louisiana, six specific types of flooding are of main concern: riverine, flash, ponding, backwater, urban, and coastal.

- **Riverine flooding** occurs along a river or smaller stream. It is the result of runoff from heavy rainfall or intensive snow or ice melt. The speed with which riverine flood levels rise and fall depends not only on the amount of rainfall, but even more on the capacity of the river itself, as well as the shape and land cover of its drainage basin. The smaller the river, the faster that water levels rise and fall. Thus, the Mississippi River levels rise and fall slowly due to its large capacity. Generally, elongated and intensely developed drainage basins will reach faster peak discharges and faster falls than circular-shaped and forested basins of the same area.
- **Flash flooding** occurs when locally intense precipitation inundates an area in a short amount of time, resulting in local stream flow and drainage capacity being overwhelmed.
- **Ponding** occurs when concave areas (e.g., parking lots, roads, and clay-lined natural low areas) collect water and are unable to drain.
- **Backwater flooding** occurs when water slowly rises from a normally unexpected direction where protection has not been provided. A model example is the flooding that occurred in LaPlace

during Hurricane Isaac in 2012. Although the town was protected by a levee on the side facing the Mississippi River, floodwaters from Lake Maurepas and Lake Pontchartrain crept into the community on the side of town opposite the Mississippi River.

- **Urban flooding** is similar to flash flooding but is specific to urbanized areas. It takes place when storm water drainage systems cannot keep pace with heavy precipitation, and water accumulates on the surface. Most urban flooding is caused by slow-moving thunderstorms or torrential rainfall.
- **Coastal flooding** can appear similar to any of the other flood types, depending on its cause. It occurs when normally dry coastal land is flooded by seawater but may be caused by direct inundation (when the sea level exceeds the elevation of the land), overtopping of a natural or artificial barrier, or the breaching of a natural or artificial barrier (i.e., when the barrier is broken down by the sea water). Coastal flooding is typically caused by storm surge, tsunamis, or gradual sea level rise.

Historically, in Bossier Parish, all types of flooding events have historically been observed except for coastal flooding. For purposes of this assessment, ponding, flash flood, and urban flooding are considered to be flooding as a result of storm water from heavy precipitation thunderstorms.

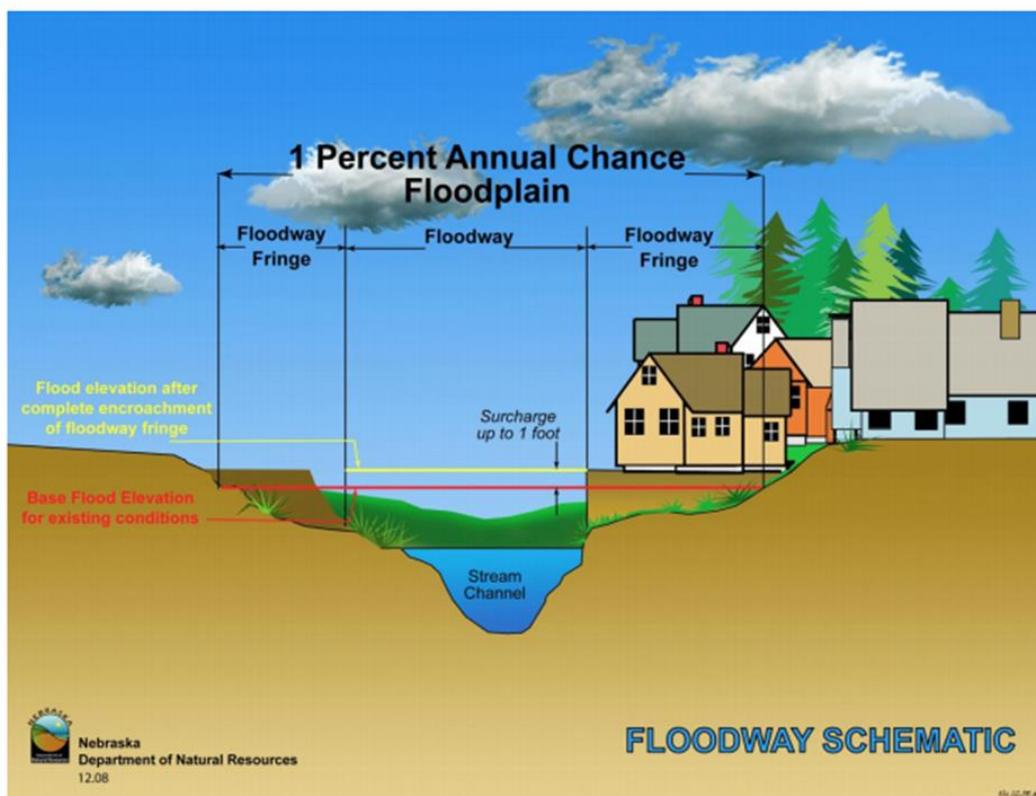
Based on stream gauge levels and precipitation forecasts, the National Weather Service (NWS) posts flood statements, watches, and warnings. The NWS issues the following weather statements with regard to flooding:

- **Flood Categories**
  - Minor Flooding: Minimal or no property damage, but possibly some public threat.
  - Moderate Flooding: Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations.
  - Major Flooding: Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
  - Record Flooding: Flooding which equals or exceeds the highest stage or discharge at a given site during the period of record keeping.
- **Flood Warning**
  - Issued along larger streams when there is a serious threat to life or property.
- **Flood Watch**
  - Issued when current and developing hydrometeorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.

Floods are measured mainly by probability of occurrence. A 10-year flood event, for example, is an event of small magnitude (in terms of stream flow or precipitation) but with a relatively high annual probability of recurrence (10%). A 100-year flood event is larger in magnitude, but it has a smaller chance of recurrence (1%). A 500-year flood is significantly larger than both a 100-year event and a 10-year event, but it has a lower probability than both to occur in any given year (0.2%). It is important to understand that an X-year flood event does not mean an event of that magnitude occurs only once in X years. Instead, it means that on average, we can expect a flood event of that magnitude to occur once every X years. Given that such statistical probability terms are inherently difficult for the general population to understand, the Association of State Floodplain Managers (ASFPM) promotes the use of more tangible expressions of flood probability. As such, the ASFPM also expresses the 100-year flood event as having a 25% chance of occurring over the life of a 30-year mortgage.

It is essential to understand that the magnitude of an X-year flood event for a particular area depends on the source of flooding and the area's location. The size of a specific flood event is defined through historic data of precipitation, flow, and discharge rates. Consequently, different 100-year flood events can have very different impacts. The 100-year flood event in two separate locations have the same likelihood to occur, but they do not necessarily have the same magnitude. For example, a 100-year event for the Mississippi River means something completely different in terms of discharge values ( $\text{ft}^3/\text{s}$ ) than for the Amite River. Not only are the magnitudes of 100-year events different between rivers, but they can also be different along any given river. A 100-year event upstream is different from one downstream due to the change of river characteristics (volume, discharge, and topography). As a result, the definition of what constitutes a 100-year flood event is specific to each location, river, and time since floodplain and river characteristics change over time. Finally, it is important to note that each flood event is unique. Two hypothetical events at the same location, given the same magnitude of stream flow, may still produce substantially different impacts if there were different antecedent moisture characteristics, different times of day of occurrence (which indicates the population's probable activities at the flood's onset), or other characteristic differences.

The 100-year flood event is of particular significance since it is the regulatory standard that determines the obligation (or lack thereof) to purchase flood insurance. Flood insurance premiums are set depending on the flood zone, as modeled by National Flood Insurance Program (NFIP) Rate Maps. The NFIP and FEMA suggest insurance rates based on Special Flood Hazard Areas (SFHAs), as diagrammed in *Figure 2-10*.



*Figure 2-10: Schematic of 100-year Floodplain. The Special Flood Hazard Area (SFHA) extends to the end of the floodway fringe.*

*(Source: Nebraska Department of Natural Resources)*

A SFHA is the land area covered by the floodwaters of the base flood (red line in *Figure 2-10*) where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

#### *Property Damage*

The depth and velocity of flood waters are the major variables in determining property damage. Flood velocity is important because the faster water moves, the more pressure it puts on a structure and the more it will erode stream banks and scour the earth around a building's foundation. In some situations, deep and fast-moving waters can push a building off its foundation. Structural damage can also be caused by the weight of standing water (hydrostatic pressure).

Another threat to property from a flood is called "soaking". When soaked, many materials change their composition or shape. Wet wood will swell, and if dried too quickly, will crack, split, or warp. Plywood can come apart and gypsum wallboard can deteriorate if it is bumped before it has time to completely dry. The longer these materials are saturated, the more moisture, sediment, and pollutants they absorb.

Soaking can also cause extensive damage to household goods. Wooden furniture may become warped, making it unusable, while other furnishings such as books, carpeting, mattresses, and upholstery usually are not salvageable. Electrical appliances and gasoline engines will flood, making them worthless until they are professionally dried and cleaned.

Many buildings that have succumbed to flood waters may look sound and unharmed after a flood, but water has the potential to cause severe property damage. Any structure that experiences a flood should be stripped, cleaned, and allowed to dry before being reconstructed. This can be an extremely expensive and time-consuming effort.

#### *Repetitive Loss Properties*

Repetitive loss structures are structures covered by a contract for flood insurance made available under the NFIP that:

- a. Have incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event; and
- b. At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage.

Severe repetitive loss (SRL) is defined by the Flood Insurance Reform Act of 2004 and updated in the Biggert-Waters Flood Insurance Reform Act of 2012. For a property to be designated SRL, the following criteria must be met:

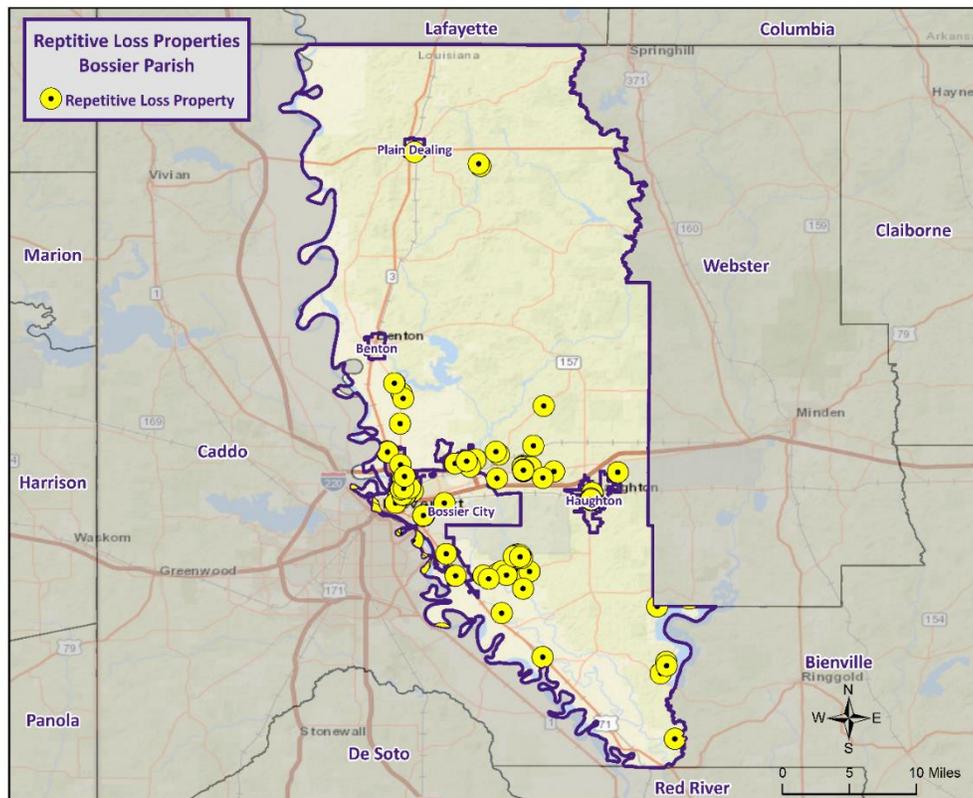
- a. It is covered under a contract for flood insurance made available under the NFIP; and
- b. It has incurred flood related damage –
  - 1) For which four or more separate claims payments have been made under flood insurance coverage with the amount of each claim exceeding \$5,000 and with the cumulative amount of such claims payments exceeding \$20,000; or
  - 2) For which at least two separate claims payments have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the insured structure.

Values regarding repetitive loss structures for Bossier Parish are provided in the table below:

*Table 2-25: Repetitive Loss Structures for Bossier Parish.*

Jurisdiction	Number of Structures	Residential	Commercial	Government	Total Claims	Total Claims Paid	Average Claim Paid
<b>Unincorporated Bossier Parish</b>	70	69	1	0	206	\$8,285,999	\$40,223
<b>Benton</b>	0	0	0	0	0	\$0	\$0
<b>Bossier City</b>	38	34	4	0	101	\$1,837,966	\$18,198
<b>Haughton</b>	11	11	0	0	27	\$1,013,774	\$37,547
<b>Plain Dealing</b>	3	3	0	0	8	\$134,998	\$16,875
<b>Total</b>	<b>122</b>	<b>117</b>	<b>5</b>	<b>0</b>	<b>342</b>	<b>\$11,272,737</b>	<b>\$32,961</b>

All 122 repetitive loss structures were geocoded in order to provide an overview of where the repetitive loss structures are located throughout the parish. *Figure 2-11* shows the approximate location of the structures, while *Figure 2-12* shows where the highest concentration of repetitive loss structures is located. Through the repetitive loss map, it is clear the primary concentrated area of repetitive loss structures is focused in and around the incorporated area of Bossier City



*Figure 2-11: Repetitive Loss Properties in Bossier Parish.*

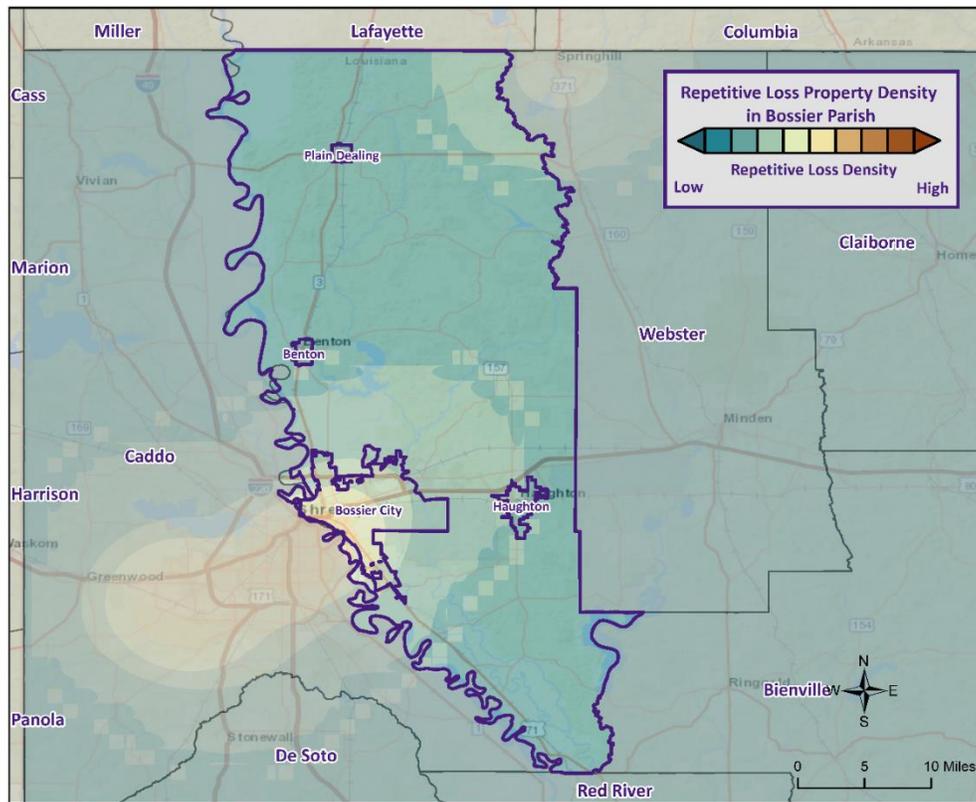


Figure 2-12: Repetitive Loss Property Densities in Bossier Parish.

#### National Flood Insurance Program

Flood insurance statistics indicate that Bossier Parish has 3,165 flood insurance policies with the NFIP, with total annual premiums of \$2,606,009. Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing are all participants in the NFIP. Bossier Parish and all of its jurisdictions will continue to adopt and enforce floodplain management requirements, including regulating new construction Special Flood Hazard Areas, making substantial improvement and/or damage determinations, or determining the necessary permits required of owners to bring a substantially improved/damaged structure back into compliance. The parish will also continue to monitor activities including local requests for new map updates. Flood insurance statistics and additional NFIP participation details for Bossier Parish and its jurisdictions is provided in the tables to follow.

Table 2-26: Summary of NFIP Policies for Bossier Parish.

Location	No. of Insured Structures	Total Insurance Coverage Value	Annual Premiums Paid	No. of Insurance Claims Filed Since 1978	Total Loss Payments
<b>Unincorporated Bossier Parish</b>	411	\$113,969,300	\$263,159	97	\$5,448,434
<b>Benton</b>	5	\$968,000	\$2,626	1	\$714
<b>Bossier City</b>	2,688	\$707,392,600	\$2,299,622	379	\$3,461,454
<b>Haughton</b>	46	\$10,820,503	\$24,492	60	\$2,397,329
<b>Plain Dealing</b>	15	\$3,072,700	\$16,110	12	\$183,794
<b>Total</b>	<b>3,165</b>	<b>\$836,223,103</b>	<b>\$2,606,009</b>	<b>549</b>	<b>\$11,491,725</b>

Table 2-27: Summary of Community Flood Maps for Bossier Parish.

CID	Community Name	Adoption Date	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Date Joined the NFIP	Tribal
220032	Benton	9/19/2013	6/14/1974	7/26/1977	3/19/13 (M)	7/26/1977	No
220033	Bossier City	9/19/2013	6/26/1974	4/4/1983	3/19/2013	4/4/1983	No
22031	Bossier Parish	9/19/2013	9/6/1977	4/18/1983	3/19/2013	4/18/1983	No
220034	Haughton	3/26/2009	6/28/1974	9/30/1981	9/26/2008	9/30/1981	No
220035	Plain Dealing	3/26/2009	6/14/1974	4/15/1981	9/26/2008	4/15/1981	No

According to the Community Rating System (CRS) list of eligible communities dated October 1, 2023, Bossier City participates in the program as a Class 9 community while the unincorporated area of Bossier Parish and the jurisdictions of Benton, Haughton, and Plain Dealing do not participate in the CRS program.

Table 2-28: Summary of Community Rating System (CRS) for Bossier Parish.

CID	Community Name	CRS Entry Date	Current Effective Date	Current Class	% Discount for SFHA	% Discount for Non-SFHA
220033	Bossier City	10/1/1992	5/1/2018	8	5	5

#### *Threat to People*

Just as with property damage, depth and velocity are major factors in determining the threat posed to people by flooding. It takes very little depth or velocity for flood waters to become dangerous. A car will float in less than two feet of moving water, and can be swept downstream into deeper waters, trapping passengers within the vehicle. Victims of floods have often put themselves in perilous situations by entering flood waters that they believe to be safe, or by ignoring travel advisories.

Major health concerns are also associated with floods. Flood waters can transport materials such as dirt, oil, animal waste, and chemicals (e.g., farm, lawn, and industrial) that may cause illnesses of various degrees when coming in contact with humans. Flood waters can also infiltrate sewer lines and inundate wastewater treatment plants, causing sewage to backup and creating a breeding ground for dangerous bacteria. This infiltration may also cause water supplies to become contaminated and undrinkable.

#### *Flooding in Bossier Parish*

By definition, flooding is caused when an area receives more water than the drainage system can convey. The following is a synopsis of the types of flooding that Bossier Parish may experience.

**Flash Floods:** Flash floods are characterized by a rapid rise in water level, high velocity, and large amounts of debris. They are capable of uprooting trees, undermining buildings, and bridges, and scouring new channels. Major factors in flash flooding are the high intensity and short duration of rainfall, as well as the steepness of watershed and stream gradients.

**Local Drainage or High Groundwater Levels:** Locally heavy precipitation may produce flooding in areas other than delineated floodplains or along recognizable drainage channels. If local conditions cannot

accommodate intense precipitation through a combination of infiltration and surface runoff, water may accumulate and cause flooding problems.

**Backwater Flooding:** Backwater flooding is normally associated with riverine flooding and connotes minimal velocity. All low-lying areas are at risk. A heavy rainfall event coupled with a swollen river, canal, bayou, or marsh hinders drainage outflow, causing backwater flooding to the same areas susceptible to storm surge.

**Riverine Flooding:** Riverine flooding, by definition, is river-based. Most of the riverine flooding problems occur when rivers crest at flood stage levels, causing extensive flooding in low-lying areas.

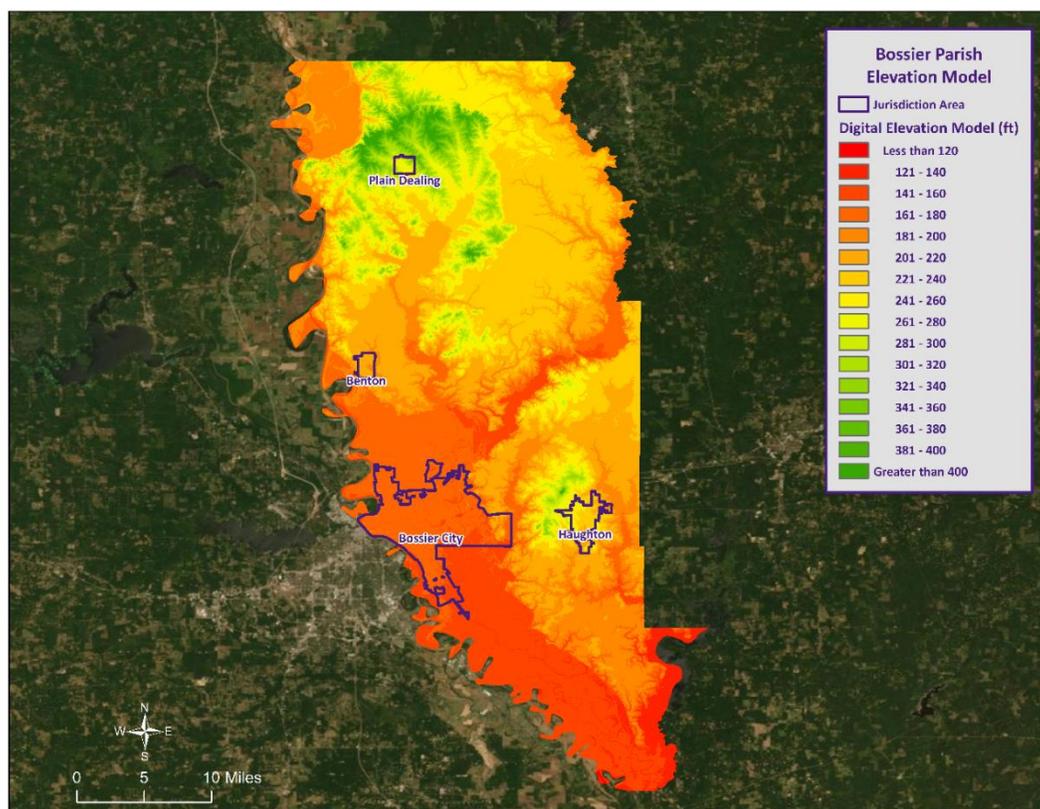


Figure 2-13: Elevation throughout Bossier Parish.

The digital elevation model (DEM) for Bossier Parish is instructive in visualizing where the low-lying and high-risk areas are for the parish. Elevations in the parish range from less than 120 feet (NAVD88) to over 400 feet (NAVD88). The highest elevations in the parish are approximately 400 feet (NAVD88), located in the northern section of the parish. The incorporated areas of the parish range in elevation from 174 feet (NAVD88) to 266 feet (NAVD88), with Benton averaging 207 feet (NAVD88), Bossier City averaging 174 feet (NAVD88), Haughton averaging 239 feet (NAVD88), and Plain Dealing averaging 266 feet (NAVD88).

#### Location

Bossier Parish has experienced significant flooding in its history and can expect more in the future. Bossier Parish is located in the northwest corner of Louisiana, across the Red River from Shreveport, Louisiana. The historic channel of the Red River forms most of the western and southern limits of the Parish. The eastern boundary is formed in part by Bayou Bodcau, Lake Bistineau, and Loggy Bayou. Heavy rains and

rising water levels, made worse in some areas by poor drainage due to urbanization, have caused flooding in many areas of the City of Bossier City, and in the communities of Benton, Haughton, and Plain Dealing, as well as the unincorporated areas of the parish, particularly in southern Bossier Parish, and around the shores of Lake Bistineau and other lakes in the parish. Flooding has occurred along major transportation routes including U.S. and State Highways, and numerous local streets and roads in and around Bossier City and other incorporated communities.

Based on previous flood events, the worst-case scenarios are based on several different types of flooding events. Storm water excesses and riverine flooding primarily affect the low-lying areas of the parish, and flood depths of up to four feet can be expected in the unincorporated areas of the parish. The incorporated areas of Benton can expect flood depths from three to five feet, while the incorporated area of Bossier City can expect flooding levels of approximately three to four feet. The incorporated areas of Haughton and Plain Dealing can expect flood levels of approximately one to three feet.

The figures below and on the following pages are flood zone maps displaying 100- and 500-year flood zones for Bossier Parish and its incorporated jurisdictions:

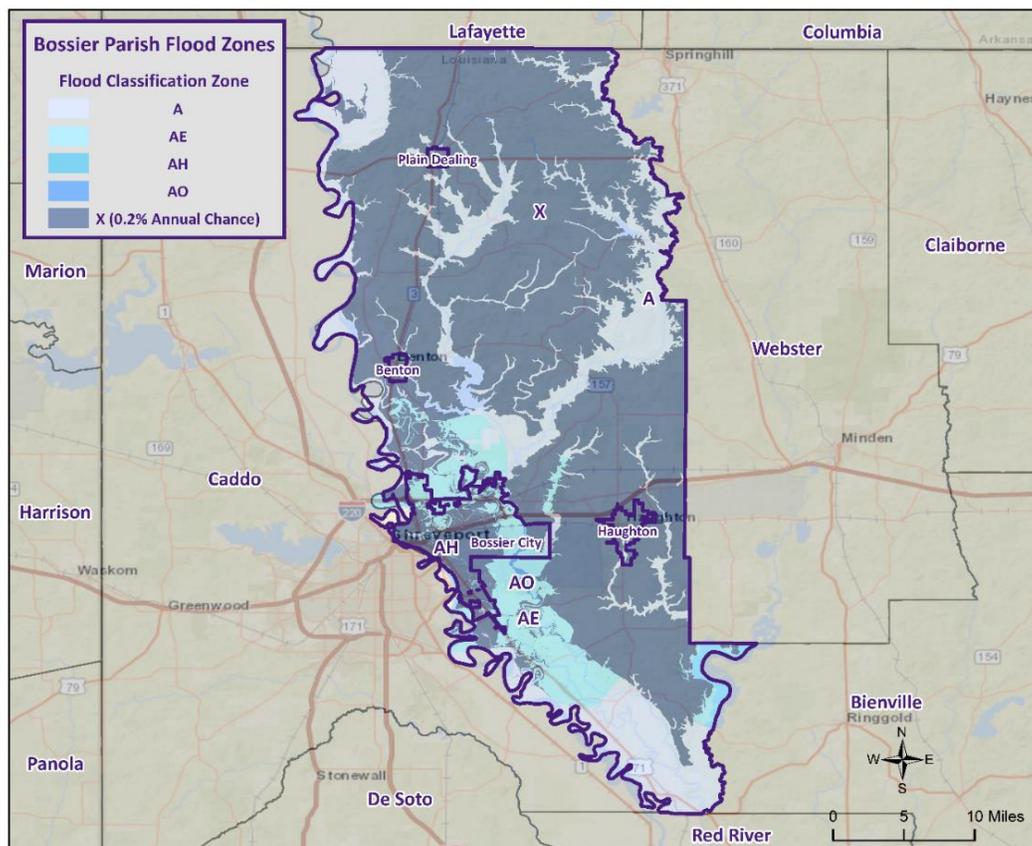


Figure 2-14: Bossier Parish Areas within the Flood Zones.

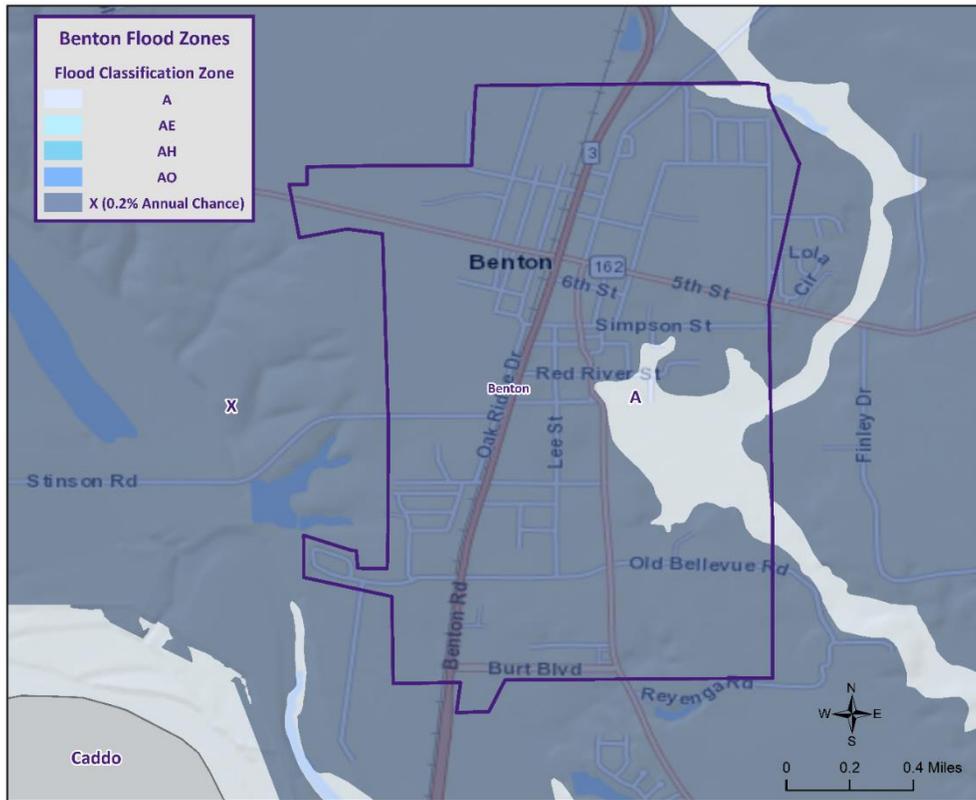


Figure 2-15: Benton Areas within the Flood Zones.

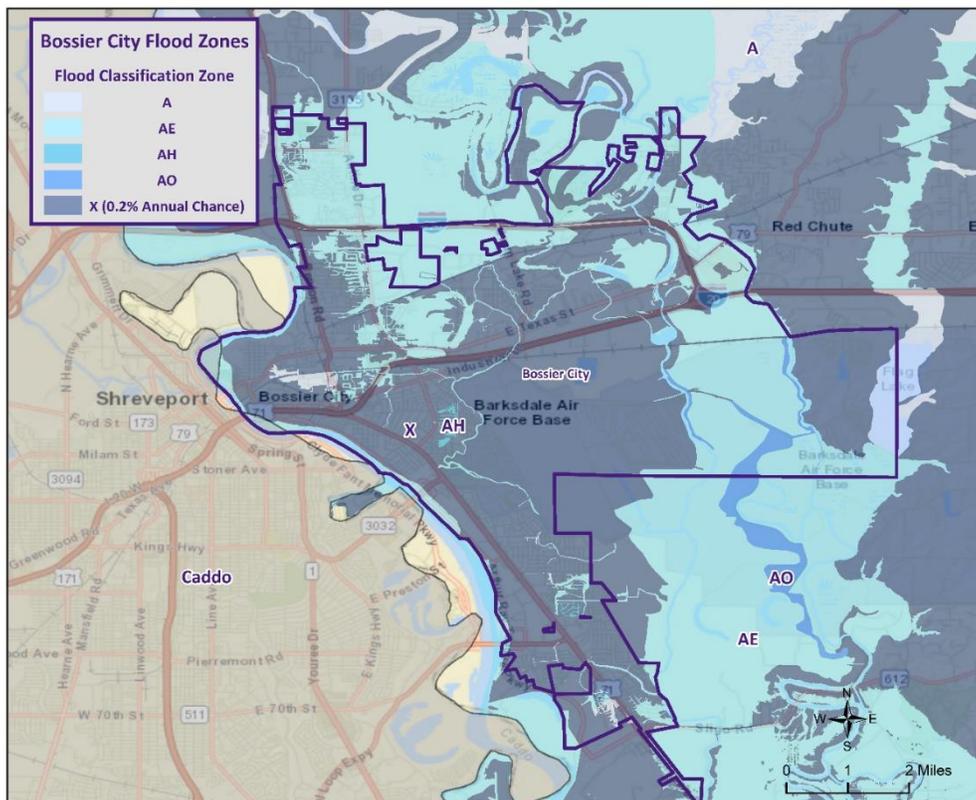


Figure 2-16: Bossier City Areas within the Flood Zones.

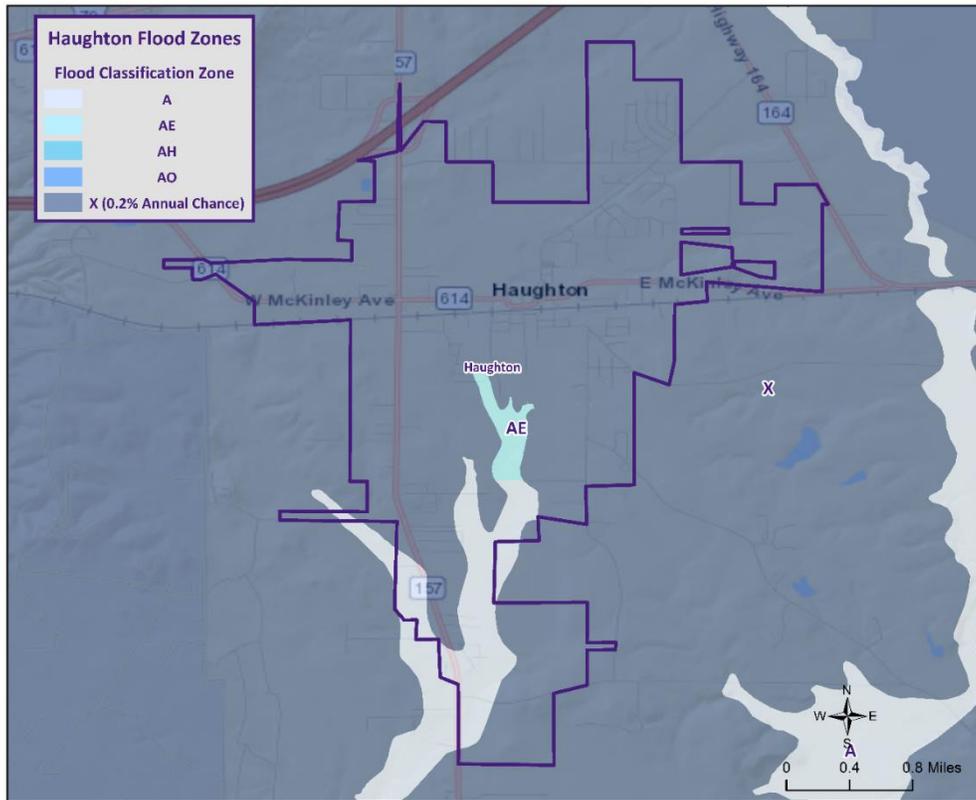


Figure 2-17: Houghton Areas within the Flood Zones.

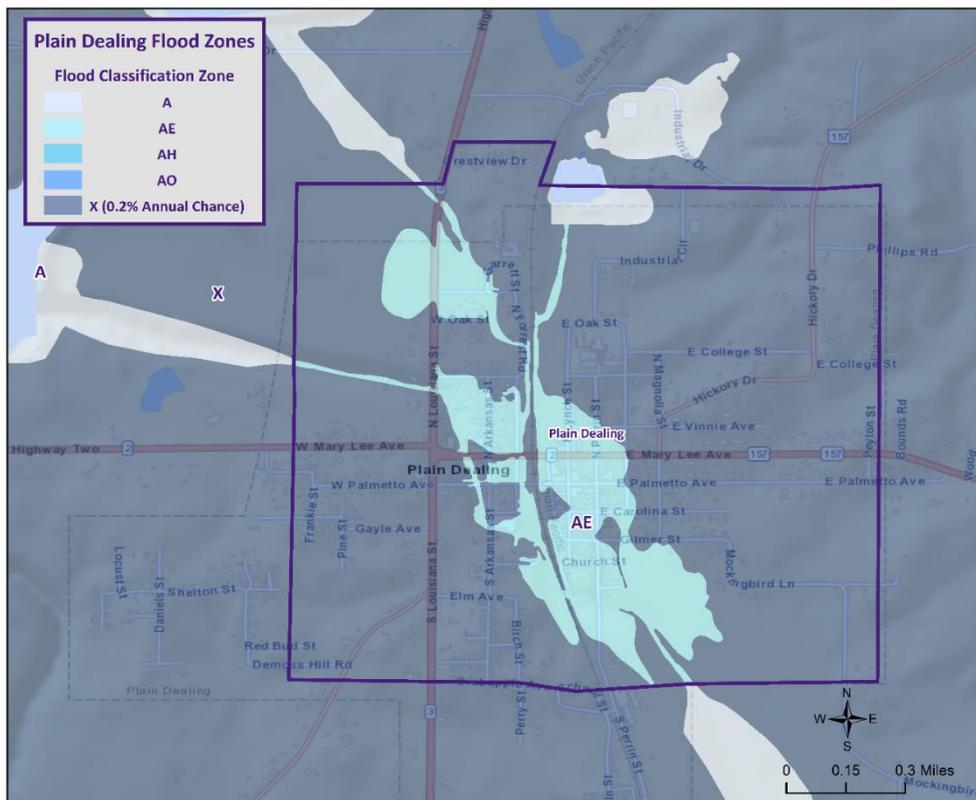


Figure 2-18: Plain Dealing Areas within the Flood Zones.

*Previous Occurrences / Extents*

Historically, there have been 109 flooding events that have caused significant flooding in Bossier Parish and its jurisdictions between 1990 and 2021. Below is a brief synopsis of the flooding events which occurred since the last Bossier Parish HMP Update in 2017.

*Table 2-29: Historical Floods in Bossier Parish with Locations since the 2017 Bossier Parish HMP Update.*

Date	Extents	Type of Flooding	Estimated Damages	Location
<b>February 21, 2018</b>	Shed Road was closed due to flooding. The North Gate at Barksdale Air Force Base was closed due to high water.	Flash Flood	\$0	PARISHWIDE
<b>September 22, 2018</b>	One lane of Airline Drive near Interstate 220 was flooded.	Flash Flood	\$0	HONORE
<b>April 13, 2019</b>	Minor flooding was observed at the Olde Oaks Golf Course.	Flood	\$0	SLIGO
<b>May 9, 2019</b>	High water covered the streets in the Colony subdivision in North Bossier City.	Flash Flood	\$0	BELLEVUE & VANCEVILLE
<b>April 22, 2020</b>	Longstreet Place in the Southgate Estates subdivision in South Bossier City was flooded.	Flash Flood	\$0	PARISHWIDE

*Frequency / Probability*

The NCEI Storm Events Database identified 109 flooding events within the Bossier Parish planning area since 1990. The table below shows the probability and return frequency for each jurisdiction.

*Table 2-30: Annual Flood Probabilities for Bossier Parish.*

Jurisdiction	Annual Probability	Return Frequency
<b>Unincorporated Bossier Parish</b>	100%	1 to 2 events every year
<b>Benton</b>	77%	1 event every 1 to 2 years
<b>Bossier City</b>	100%	1 to 2 events every year
<b>Haughton</b>	52%	1 event every 1 to 2 years
<b>Plain Dealing</b>	65%	1 event every 1 to 2 years

Based on historical record, the overall flooding probability for the entire Bossier Parish Planning area is 100% with 109 events occurring over a 31-year period.

*Estimated Potential Losses*

Using the Hazus Flood Model, the 100-year flood scenario, along with the Parish DFIRM, was analyzed to determine losses from this worst-case scenario. *Table 2-31* shows the total economic losses that would result from this occurrence.

*Table 2-31: Estimated Losses in Bossier Parish from a 100-year Flood Event.  
(Source: Hazus)*

Jurisdiction	Estimated Total Losses from 100-Year Flood Event
<b>Unincorporated Bossier Parish</b>	\$313,063,000
<b>Benton</b>	\$298,000
<b>Bossier City</b>	\$264,327,000
<b>Haughton</b>	\$229,000
<b>Plain Dealing</b>	\$14,871,000
<b>Total</b>	<b>\$592,788,000</b>

The Hazus Flood model also provides a breakdown for seven primary sectors (Hazus occupancy) throughout the parish. The losses for the jurisdictions by sector are listed in the following tables:

*Table 2-32: Estimated 100-year Flood Losses for Bossier Parish by Sector.  
(Source: Hazus)*

Unincorporated Bossier Parish	Estimated Total Losses from 100-Year Flood Event
<b>Agricultural</b>	\$1,036,000
<b>Commercial</b>	\$86,144,000
<b>Government</b>	\$3,759,000
<b>Industrial</b>	\$5,432,000
<b>Religious / Non-Profit</b>	\$7,207,000
<b>Residential</b>	\$204,221,000
<b>Schools</b>	\$5,264,000
<b>Total</b>	<b>\$313,063,000</b>

*Table 2-33: Estimated 100-year Flood Losses for Benton by Sector.  
(Source: Hazus)*

Benton	Estimated Total Losses from 100-Year Flood Event
<b>Agricultural</b>	\$0
<b>Commercial</b>	\$0
<b>Government</b>	\$0
<b>Industrial</b>	\$0
<b>Religious / Non-Profit</b>	\$0
<b>Residential</b>	\$298,000
<b>Schools</b>	\$0
<b>Total</b>	<b>\$298,000</b>

*Table 2-34: Estimated 100-year Flood Losses for Bossier City by Sector.  
(Source: Hazus)*

<b>Bossier City</b>	<b>Estimated Total Losses from 100-Year Flood Event</b>
Agricultural	\$538,000
Commercial	\$16,886,000
Government	\$4,812,000
Industrial	\$9,671,000
Religious / Non-Profit	\$5,703,000
Residential	\$218,886,000
Schools	\$7,831,000
<b>Total</b>	<b>\$264,327,000</b>

*Table 2-35: Estimated 100-year Flood Losses for Haughton by Sector.  
(Source: Hazus)*

<b>Haughton</b>	<b>Estimated Total Losses from 100-Year Flood Event</b>
Agricultural	\$0
Commercial	\$0
Government	\$0
Industrial	\$0
Religious / Non-Profit	\$0
Residential	\$229,000
Schools	\$0
<b>Total</b>	<b>\$229,000</b>

*Table 2-36: Estimated 100-year Flood Losses for Plain Dealing by Sector.  
(Source: Hazus)*

<b>Plain Dealing</b>	<b>Estimated Total Losses from 100-Year Flood Event</b>
Agricultural	\$0
Commercial	\$2,103,000
Government	\$2,767,000
Industrial	\$101,000
Religious / Non-Profit	\$2,506,000
Residential	\$4,474,000
Schools	\$2,920,000
<b>Total</b>	<b>\$14,871,000</b>

*Threat to People*

The total population within the parish that is susceptible to a flood hazard is shown in the table below:

*Table 2-37: Vulnerable Populations Susceptible to a 100-year Flood Event.*

*(Source: Hazus)*

<b>Number of People Exposed to Flood Hazards</b>			
<b>Location</b>	<b># in Community</b>	<b># in Hazard Area</b>	<b>% in Hazard Area</b>
<b>Unincorporated Bossier Parish</b>	58,565	6,784	11.6%
<b>Benton</b>	2,048	99	4.8%
<b>Bossier City</b>	62,701	14,090	22.5%
<b>Haughton</b>	4,539	151	3.3%
<b>Plain Dealing</b>	893	314	35.2%
<b>Total</b>	<b>128,746</b>	<b>21,438</b>	<b>16.7%</b>

The Hazus flood model was also extrapolated to provide an overview of vulnerable populations throughout the jurisdictions in the following tables:

*Table 2-38: Vulnerable Populations Susceptible to a 100-year Flood Event in Bossier Parish.*

*(Source: Hazus)*

<b>Unincorporated Bossier Parish</b>		
<b>Category</b>	<b>Total Numbers</b>	<b>Percentage of People in Hazard Area</b>
<b>Number in Hazard Area</b>	6,784	11.6%
<b>Persons Under 5 Years</b>	468	6.9%
<b>Persons Under 18 Years</b>	1,682	24.8%
<b>Persons 65 Years and Over</b>	957	14.1%
<b>White</b>	4,271	63.0%
<b>Minority</b>	2,513	37.0%

*Table 2-39: Vulnerable Populations Susceptible to a 100-year Flood Event in Benton.*

*(Source: Hazus)*

<b>Benton</b>		
<b>Category</b>	<b>Total Numbers</b>	<b>Percentage of People in Hazard Area</b>
<b>Number in Hazard Area</b>	99	4.8%
<b>Persons Under 5 Years</b>	9	9.4%
<b>Persons Under 18 Years</b>	20	20.6%
<b>Persons 65 Years and Over</b>	14	13.7%
<b>White</b>	54	54.5%
<b>Minority</b>	45	45.5%

*Table 2-40: Vulnerable Populations Susceptible to a 100-year Flood Event in Bossier City.  
(Source: Hazus)*

Bossier City		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	14,090	22.5%
Persons Under 5 Years	1,014	7.2%
Persons Under 18 Years	3,325	23.6%
Persons 65 Years and Over	2,085	14.8%
White	7,425	52.7%
Minority	6,665	47.3%

*Table 2-41: Vulnerable Populations Susceptible to a 100-year Flood Event in Haughton.  
(Source: Hazus)*

Haughton		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	151	3.3%
Persons Under 5 Years	10	6.6%
Persons Under 18 Years	41	27.2%
Persons 65 Years and Over	11	7.4%
White	107	70.9%
Minority	44	29.1%

*Table 2-42: Vulnerable Populations Susceptible to a 100-year Flood Event in Plain Dealing.  
(Source: Hazus)*

Plain Dealing		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	314	35.2%
Persons Under 5 Years	10	3.1%
Persons Under 18 Years	39	12.5%
Persons 65 Years and Over	79	25.2%
White	157	50.1%
Minority	157	49.9%

### *Impacts of Climate Change*

Atmospheric moisture, precipitation, and atmospheric circulation can be affected by climate change, since radiative forcing alters heating which affects evaporation and sensible heating at the Earth's surface. This process alters the amount, frequency, intensity, duration, and type of precipitation which is part of the hydrological cycle within Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing.

The Intergovernmental Panel on Climate Change reports that over 105-year period (1901 – 2005) precipitation has increased 5 to 10%. Additionally, water resource managers observed the following:

- Historical hydrological patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply quality, flood management, and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection and emergency response.

The National Risk Index (NRI) includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the parish and Census tract level. The following table provides an overview of each category at the parish level for flooding.

*Table 2-43: National Risk Index (NRI) Summarization of Flooding Occurrences for the Parish  
(Source: National Risk Index)*

<b>Expected Annual Losses</b>	<b>Overall Risk Rating</b>
Relatively High	Relatively High

Vulnerable populations living in floodplain areas or near rivers are at higher risk of displacement, property damage, and loss of essential services and infrastructure during riverine flooding events. Flooding events associated with climate change can pose significant health risks to vulnerable populations. Floodwaters can be contaminated with pollutants, sewage, and harmful chemicals, increasing the risk of waterborne diseases and infections. Disruption of sanitation systems and access to clean water during floods can exacerbate health issues, particularly for communities with limited resources and inadequate healthcare infrastructure.

To address the impacts of flooding on vulnerable populations, it is crucial to implement comprehensive strategies that include:

- Improved early warning systems and evacuation plans to ensure the timely and safe evacuation of vulnerable populations before floods occur.
- Enhancing infrastructure resilience, such as constructing or retrofitting buildings to withstand flood events and implementing effective drainage systems.
- Investing in floodplain management and land-use planning to restrict development in high-risk flood areas and promote sustainable urban design.
- Strengthening social safety nets and community-based adaptation measures to support vulnerable populations during and after flood events.
- Enhancing access to affordable flood insurance and financial assistance for vulnerable communities.
- Promoting climate change adaptation and mitigation measures to reduce the severity and frequency of flooding events in the long term.

By integrating these measures, it is possible to reduce the impacts of flooding on vulnerable populations and enhance their resilience in the face of climate change.

*Vulnerability*

See [Appendix C](#) for parish and municipality buildings that are susceptible to flooding due to proximity within the 100-year floodplain.

### Levee Failure

Levees and floodwalls are flood control barriers constructed of earth, concrete, or other materials. For the purposes of this plan, levees are distinguished from smaller flood barriers (such as berms) by their size and extent. Berms are barriers that only protect a small number of structures, or at times only a single structure. Levees and floodwalls are barriers that protect significant areas of residential, commercial, or industrial development; at a minimum, they protect a neighborhood or small community. Levee failure involves the overtopping, breach, or collapse of the levee. Levee failure is especially destructive to nearby development during flood and hurricane events.

The northern half of Louisiana is protected by levees on the Ouachita River, under the authority of the Vicksburg District of the United States Army Corp of Engineers (USACE). The Vicksburg District encompasses 68,000 mi<sup>2</sup> in the states of Arkansas, Mississippi and Louisiana. They manage seven drainage basins, including the Yazoo, Pearl, Big Black, Red, Ouachita, and Mississippi Rivers; 12 locks and dams on the Pearl, Red, and Ouachita Rivers; 1,808 miles of levees, including 468 miles along the Mississippi River; and multiple lakes with 1,709 miles of shoreline.

Coastal and southern Louisiana are protected by an extensive levee system under the authority of the New Orleans District of the USACE. This system includes 30,000 mi<sup>2</sup> of Louisiana south of Benton, including 961 miles of river levees in the Mississippi River and Tributaries Project, 449 miles of river levees in the Atchafalaya Basin, and 340 miles of hurricane-protection levees. Other levees have been built along stretches of rivers throughout Louisiana by local levee districts and private citizens. The data regarding these non-federal levees are managed by the individual entity responsible for construction and subsequent maintenance and are not kept in a consistent format for comprehensive hazard analysis.

The effects of a levee failure on property is similar to that of a flood, as discussed in the flooding section. One major difference is that the velocity of the water is increased in the area of the breach, so the potential for property damage is higher in these areas.

A levee failure occurs during high water events, so the populace is normally alerted to the potential danger. Levees are normally monitored during these events and the population in danger is alerted to a possible levee failure. However, if people consider themselves safe once a levee has been breached and do not evacuate, the results could be deadly.

The Mississippi River levee system is constantly monitored during high water events by federal, state, and parish officials. Any potential failure of the Mississippi River levee would be observed long before a failure took place. Once observed, it would be mitigated to prevent any failure in the levee. As a slowly developing hazard, there is significant lead time to warn and evacuate the population in the event of a potential failure. The more likely scenario involving a potential levee failure would be an overtopping event for a major precipitation event taking place during a tropical cyclone, similar to Tropical Storm Allison in 2001. An event of this nature is less likely to produce an early warning and most likely to subject more people to flooding,

### Location

Levees play a vital role in protecting Bossier Parish from flooding, particularly floods caused by tropical cyclones. Several areas in the western and central portion of the parish are protected by levees. There are currently seven levee alignments that exist within the parish:

- Bossier Levee
- Flat River Agricultural Canal Levee System
- Long Prairie
- Red Chute Bayou
- Red River – West Agurs
- Red River East Bank – South Levee System
- Red River East Bank – North Bossier Auxiliary System

These levees are tested anytime a high-water event such as a tropical cyclone or heavy rainstorm occurs. The levees located in Bossier Parish are shown in the following figure:

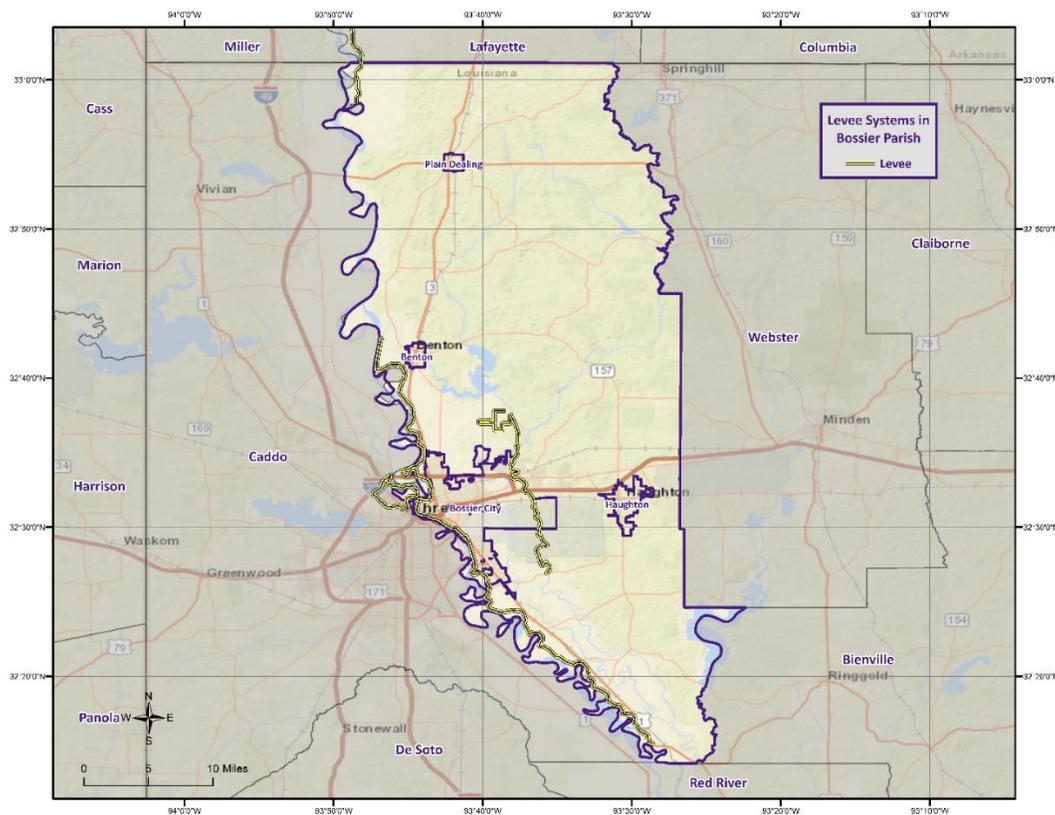


Figure 2-19: Levee Systems in Bossier Parish.

### Previous Occurrences / Extents

The NCEI Storm Events Database does not record anthropogenic disasters such as levee failures; therefore, it was necessary to rely on local knowledge and media reports. Since the 2017 HMP Update, there has been no flooding event due to levee failure in Bossier Parish. As a worst-case scenario, the unincorporated area of Bossier Parish along with the incorporated areas of Benton and Bossier City could expect to experience flood depths of 10 to 20 feet in the event of a levee failure. The extent of the flooding is unknown; therefore, a data deficiency is declared at this time.

*Frequency / Probability*

It is nearly impossible to predict and model levee failure and its impacts on Bossier Parish. Due to the unpredictability of levee failures, it is calculated that the probability of a levee failure is less than 1% annually for the unincorporated areas Bossier Parish and the incorporated areas of Benton and Bossier City. The incorporated areas of Haughton and Plain Dealing are not susceptible to levee failures. The areas of inundation will generally be directly downstream of the dam and the low-lying areas surrounding the area of levee failure, but a working group will be established to determine the specific locations of inundation. The actions for a levee failure working group can be found in [Section 4: Mitigation Strategy](#).

*Estimated Potential Loses*

Determining the annualized loss as a result of levee failure is difficult in Bossier Parish due to availability of data on past levee failure events. The National Levee Database (NLD) was utilized to determine the levee systems within Bossier Parish, the risk level, and populace/infrastructure at risk. The NLD is a congressional authorized database that documents levees in the United States and is maintained by the U.S. Army Corps of Engineers (USACE). The following table provides an extensive list of the levee systems in Bossier Parish and the risk associated with each system.

*Table 2-44: Levee Systems and Risk Associated with each System in Bossier Parish and Surrounding Parishes.*

*(Source: National Levee Database)*

Levee System	Length (Miles)	People at Risk	Structures at Risk	Property Value at Risk	Overall Risk
<b>Bossier Levee</b>	48.68	83,962	27,011	\$13.3 Billion	Moderate
<b>Flat River Agricultural Canal Levee System</b>	6.64	0	3	\$2.92 Million	Not Screened
<b>Long Prairie</b>	20.23	697	194	\$43.2 Million	Low
<b>Red Chute Bayou</b>	18.92	2,935	1,183	\$498 Million	Low
<b>Red River – West Agurs</b>	7.91	10,582	1,352	\$1.23 Billion	Moderate
<b>Red River East Bank – South Levee System</b>	2.5	0	2	\$0	Not Screened
<b>Red River East Bank – North Bossier Auxiliary System</b>	0.22	0	0	\$0	Not Screened

*Impacts of Climate Change*

Climate change is significantly impacting levee failure and posing a greater risk to vulnerable populations living in areas protected by levees. Rising sea levels, a consequence of climate change, are putting coastal levees at risk. As sea levels continue to rise due to melting ice caps and glaciers, coastal regions face an increased likelihood of flooding during storm surges and extreme weather events. The pressure exerted on the existing levee systems compromises their effectiveness and raises the chances of failure.

Moreover, climate change is altering rainfall patterns, resulting in more intense and frequent heavy rainfall events. These extreme precipitation events can overwhelm the capacity of levee systems designed based on historical data. Consequently, the excess water can breach or overtop levees, leading to the flooding of protected areas. This poses a severe threat to vulnerable populations residing in these regions, as they are disproportionately affected by the impacts of flooding, such as property damage, displacement, and loss of livelihoods.

It is crucial to note that vulnerable populations often inhabit areas protected by levees due to limited housing options and socioeconomic disparities. Low-income communities, ethnic minorities, and marginalized groups are at a higher risk as they may lack the resources, access to early warning systems, and evacuation plans necessary to respond effectively to levee failures and subsequent flooding. Social vulnerability intersects with climate change impacts, exacerbating the risks faced by these populations.

*Vulnerability*

See [Appendix C](#) for parish and municipality building exposure to levee failures.

## Thunderstorms

The term “thunderstorm” is usually used as a catch-all term for several kinds of storms. Here “thunderstorm” is defined to include any precipitation event in which thunder is heard or lightning is seen. Thunderstorms are often accompanied by heavy rain and strong winds and, depending on conditions, occasionally by hail or snow. Thunderstorms form when humid air masses are heated, which causes them to become convectively unstable and therefore rise. Upon rising, the air masses’ water vapor condenses into liquid water and/or deposits directly into ice when they rise sufficiently to cool to the dew-point temperature.

Thunderstorms are classified into four main types (single cell, multicell, squall line, and supercell), depending on the degree of atmospheric instability, the change in wind speed with height (called wind shear), and the degree to which the storm’s internal dynamics are coordinated with those of adjacent storms. There is no such interaction for single-cell thunderstorms, but there is significant interaction with clusters of adjacent thunderstorms in multicell thunderstorms and with a linear “chain” of adjacent storms in squall line thunderstorms. Though supercell storms have no significant interactions with other storms, they have very well-organized and self-sustaining internal dynamics, which allows them to be the longest-lived and most severe of all thunderstorms.

The life of a thunderstorm proceeds through three stages: the developing (or cumulus) stage, the mature stage, and the dissipation stage. During the developing stage, the unstable air mass is lifted as an updraft into the atmosphere. This sudden lift rapidly cools the moisture in the air mass, releasing latent heat as condensation and/or deposition occurs, and warming the surrounding environment, thus making it less dense than the surrounding air. This process intensifies the updraft and creates a localized lateral rush of air from all directions into the area beneath the thunderstorm to feed continued updrafts. At the mature stage, the rising air is accompanied by downdrafts caused by the shear of falling rain (if melted completely), or hail, freezing rain, sleet, or snow (if not melted completely). The dissipation stage is characterized by the dominating presence of the downdraft as the hot surface that gave the updrafts their buoyancy is cooled by precipitation. During the dissipation stage, the moisture in the air mass largely empties out.

The Storm Prediction Center in conjunction with the National Weather Service (NWS) have the ability to issue advisory messages based on forecasts and observations. The following are the advisory messages that may be issued with definitions of each:

- ***Severe Thunderstorm Watch:*** Issued to alert people to the possibility of a severe thunderstorm developing in the area. Expected time frame for these storms is three to six hours.
- ***Severe Thunderstorm Warning:*** Issued when severe thunderstorms are imminent. This warning is highly localized and covers parts of one to several counties (parishes).

A variety of hazards might be produced by thunderstorms, including lightning, hail, tornadoes or waterspouts, flash floods, and high-speed winds called downbursts. Nevertheless, given all of these criteria, the National Oceanic and Atmospheric Administration (NOAA) characterizes a thunderstorm as severe when it produces one or more of the following:

- Hail of 1 inch in diameter or larger
- Wind gusts to 58 mph or greater
- One or more tornadoes

Tornadoes and flooding hazards have been profiled within this report; therefore, for the purpose of thunderstorms, the sub hazards of hail, high winds, and lightning will be profiled.

Thunderstorms occur throughout Louisiana at all times of the year, although the types and severity of those storms vary greatly, depending on a wide variety of atmospheric conditions. Thunderstorms generally occur more frequently during the late spring and early summer when extreme variations exist between ground surface temperatures and upper atmospheric temperatures.

### *Hazard Description*

#### **Hailstorms**

Hailstorms are severe thunderstorms in which balls or chunks of ice fall along with rain. Hail develops in the upper atmosphere initially as ice crystals that are bounced about by high-velocity updraft winds. The ice crystals grow through deposition of water vapor onto their surface, fall partially to a level in the cloud where the temperature exceeds the freezing point, melt partially, get caught in another updraft whereupon re-freezing and deposition grows another concentric layer of ice, and fall after developing enough weight, sometimes after several trips up and down the cloud. The size of hailstones varies depending on the severity and size of the thunderstorm. Higher surface temperatures generally mean stronger updrafts, which allows more massive hailstones to be supported by updrafts, leaving them suspended longer. This longer time means larger hailstone sizes. The following tables display the TORRO Hailstorm Intensity Scale along with a spectrum of hailstone diameters and their everyday equivalents.

*Table 2-45: TORRO Hailstorm Intensity Scale.*

Intensity Category		Hail Diameter (mm)	Probable Kinetic Energy	Typical Damage Impacts
<b>H0</b>	Hard Hail	5	0 - 20	No damage
<b>H1</b>	Potentially Damaging	5 - 15	>20	Slight general damage to plant, crops
<b>H2</b>	Significant	10 - 20	>100	Significant damage to fruit, crops, vegetation
<b>H3</b>	Severe	20 - 30	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
<b>H4</b>	Severe	25 - 40	>500	Widespread glass damage, vehicle body work
<b>H5</b>	Destructive	30 - 50	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
<b>H6</b>	Destructive	40 - 60		Bodywork of grounded aircraft dented; brick walls pitted
<b>H7</b>	Destructive	50 - 75		Severe roof damage, risk of serious injuries
<b>H8</b>	Destructive	60 - 90		Severe damage to aircraft bodywork

Intensity Category		Hail Diameter (mm)	Probable Kinetic Energy	Typical Damage Impacts
H9	Super Hailstorms	75 - 100		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

*Table 2-46: Spectrum of Hailstone Diameters and their Everyday Description.  
(Source: National Weather Service)*

Spectrum of Hailstone Diameters	
Hail Diameter Size	Description
1/4"	Pea
1/2"	Plain M&M
3/4"	Penny
7/8"	Nickle
1" (severe)	Quarter
1 1/4"	Half Dollar
1 1/2"	Ping Pong Ball / Walnut
1 3/4"	Golf Ball
2"	Hen Egg / Lime
2 1/2"	Tennis Ball
2 3/4"	Baseball
3"	Teacup / Large Apple
4"	Softball
4 1/2"	Grapefruit
4 3/4" – 5"	Computer CD-DVD

Hailstorms can cause widespread damage to homes and other structures, automobiles, and crops. While the damage to individual structures or vehicles is often minor, the cumulative cost to communities, especially across large metropolitan areas, can be quite significant. Hailstorms can also be devastating to crops. Thus, the severity of hailstorms depends on the size of the hailstones, the length of time the storm lasts, and where it occurs.

Hail rarely causes loss of life, although large hailstones can cause bodily injury.

#### High Winds

In general, high winds can occur in a number of different ways, within and without thunderstorms. The Federal Emergency Management Agency (FEMA) distinguishes these as shown in *Table 2-47* on the following page.

*Table 2-47: High Winds Categorized by Source, Frequency, and Duration.  
(Source: Making Critical Facilities Safe from High Wind, FEMA)*

High Wind Categories			
High Wind Type	Description	Relative Frequency in Louisiana	Relative Maximum Duration in Louisiana
<b>Straight-line Winds</b>	Wind blowing in straight line; usually associated with intense low-pressure area	High	Few-minutes – 1 day
<b>Downslope Winds</b>	Wind blowing down the slope of a mountain; associated with temperature and pressure gradients	N/A	N/A
<b>Thunderstorm Winds</b>	Wind blowing due to thunderstorms, and thus associated with temperature and pressure gradients	High (especially in the spring and summer)	~Few minutes – several hours
<b>Downbursts</b>	Sudden wind blowing down due to downdraft in a thunderstorm; spreads out horizontally at the ground, possibly forming horizontal vortex rings around the downdraft	Medium-to-High (~5% of all thunderstorms)	~15 – 20 minutes
<b>Northeaster (nor'easter) Winds</b>	Wind blowing due to cyclonic storm off the east coast of North America; associated with temperature and pressure gradients between the Atlantic and land	N/A	N/A
<b>Hurricane Winds</b>	Wind blowing in spirals, converging with increasing speed toward eye; associated with temperature and pressure gradients between the Atlantic and Gulf and land	Low-to-Medium	Several days
<b>Tornado Winds</b>	Violently rotating column of air from base of a thunderstorm to the ground with rapidly decreasing winds at greater distances from center; associated with extreme temperature gradient	Low-to-Medium	Few minutes – few hours

The only high winds of present concern are thunderstorm winds and downbursts. Straight-line winds are common but are a relatively insignificant hazard (on land) compared to other high winds. Downslope winds are common but relatively insignificant in the mountainous areas of Louisiana where they occur. Nor'easters are cyclonic events that have at most a peripheral effect on Louisiana, and none associated with high winds. Winds associated with hurricanes and tornadoes will be considered in their respective sections.

*Table 2-48* on the following page presents the Beaufort Wind Scale, first developed in 1805 by Sir Francis Beaufort, which aids in determining relative force and wind speed based on the appearance of wind effects.

Table 2-48: Beaufort Wind Scale.  
(Source: NOAA's SPC)

Beaufort Wind Scale			
Force	Wind (MPH)	WMO Classification	Appearance of Wind Effects on Land
			Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-17	Moderate Breeze	Dust, leaves, and loose paper lifted; small tree branches move
5	18-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-30	Strong Breeze	Larger tree branches moving, whistling in wires
7	31-38	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	Gale	Twigs breaking off trees, generally impedes progress
9	47-54	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	54-73	Violent Storm	
12	74+	Hurricane	

Major damage directly caused by thunderstorm winds is relatively rare, while minor damage is common and pervasive, and most noticeable when it contributes to power outages. These power outages can have major negative impacts such as increased tendency for traffic accidents, loss of revenue for businesses, increased vulnerability to fire, food spoilage, and other losses that might be sustained by a loss of power.

Power outages may pose a health risk for those requiring electric medical equipment and/or air conditioning.

### Lightning

Lightning is a natural electrical discharge in the atmosphere that is a by-product of thunderstorms. Every thunderstorm produces lightning. There are three primary types of lightning: intra-cloud, cloud-to-ground, and cloud-to-cloud. Cloud-to-ground lightning has the potential to cause the most damage to property and crops, while also posing as a health risk to the populace in the area of the strike.

Damage caused by lightning is usually to homes or businesses. These strikes have the ability to damage electrical equipment inside the home or business and can also ignite a fire that could destroy homes or crops.

Lightning continues to be one of the top three storm-related killers in the United States per FEMA, but it also has the ability to cause negative long-term health effects to the individual that is struck. The table on the following page outlines the lightning activity level that is a measurement of lightning activity.

Table 2-49: Lightning Activity Level (LAL) Grids.

LAL	Cloud and Storm Development	Lightning Strikes/15 Min
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reaches the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common, and lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent.	>25
6	Similar to LAL 3 except thunderstorms are dry	

#### Impacts of Climate Change

The impact of climate change on thunderstorms is not well understood at this time. However, thunderstorms are complex, dynamic systems fueled by heat and moisture which can be measured with CAPE (convective available potential energy). It is predicted that CAPE will increase within Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing and across the Eastern United States by the second half of the 21<sup>st</sup> century, meaning there is more energy to fuel severe thunderstorms. In this same time frame, there would be a small decrease in vertical wind shear, which helps produce long-lived severe storms. However, the increase in energy outweighs the decreasing shear to produce a net increase in environmental favorability for severe thunderstorms by the end of the century. Some climate models maintained by the Goddard Institute for Space Studies indicate that the number of severe thunderstorms will not change much, but the severe storms that do occur would have stronger winds and more intense precipitation.

The National Risk Index (NRI) includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the parish and Census tract level. The following table provides an overview of each category at the parish level for thunderstorms.

Table 2-50: National Risk Index (NRI) Summarization of Thunderstorm Occurrences for the Parish  
(Source: National Risk Index)

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Intense thunderstorms associated with climate change can damage infrastructure and disrupt essential services. Strong winds and heavy rainfall can cause power outages, damage to electrical grids, and interruptions in communication systems. Vulnerable populations relying on these services, such as healthcare facilities, emergency response systems, and communities with limited resources, may face additional challenges and risks during and after thunderstorm events.

To address the impacts of thunderstorms on vulnerable populations, it is important to:

- Strengthen early warning systems and dissemination of weather alerts to ensure that vulnerable populations receive timely and accurate information.
- Improve infrastructure resilience to withstand severe weather events, including thunderstorms, through measures such as reinforcing buildings, implementing effective drainage systems, and securing power and communication networks.
- Enhance community preparedness through education and training on thunderstorm safety measures, including appropriate responses to lightning hazards and flash flooding.
- Develop and implement emergency response plans that consider the specific needs and vulnerabilities of the local population, including the elderly, disabled individuals, and those with limited mobility or access to transportation.
- Promote the availability of safe shelters or evacuation centers for vulnerable populations during thunderstorms and other severe weather events.
- Implement climate change adaptation strategies, including land-use planning and ecosystem-based approaches, to mitigate the impacts of thunderstorms and reduce vulnerabilities in the long term.

### *Hazard Profile*

#### Hailstorms

##### Location

Hailstorms are a meteorological phenomenon that can occur anywhere. Therefore, the entire planning area for Bossier Parish and its jurisdictions are equally at risk for hailstorms. The worst-case scenario for hailstorms is hail up to a 2.75" diameter.

##### Previous Occurrences / Extents

Historically, there have been 268 hail incidents in Bossier Parish. Hailstorm diameters have ranged from 0.5 inches to 4.5 inches per the National Climatic Data Center since 1990. The most frequently recorded hail sizes have been 1-inch in diameter. Below is a brief synopsis of significant hailstorm events that have occurred in Bossier Parish since the 2017 Bossier Parish HMP update.

*Table 2-51: Previous Occurrences for Hailstorm Events since the 2017 Hazard Mitigation Plan Update.*

*(Source: NCEI Storm Events Database)*

Date	Hail Size (inches)	Property Damage	Crop Damage
January 21, 2017	1.75	\$0	\$0
January 21, 2017	1	\$0	\$0
May 28, 2017	1	\$0	\$0
May 28, 2017	0.75	\$0	\$0
May 28, 2017	1	\$0	\$0
May 28, 2017	1	\$0	\$0
May 28, 2017	0.88	\$0	\$0
April 6, 2018	1	\$0	\$0
April 6, 2018	1.75	\$0	\$0
April 6, 2018	1.25	\$0	\$0

March 25, 2019	1.5	\$0	\$0
April 6, 2019	1	\$0	\$0
April 13, 2019	1	\$0	\$0
April 13, 2019	1	\$0	\$0
March 4, 2020	0.88	\$0	\$0
April 24, 2020	1	\$0	\$0
April 24, 2020	1	\$0	\$0
April 24, 2020	1.5	\$0	\$0
April 24, 2020	1	\$0	\$0
April 24, 2020	1	\$0	\$0
April 24, 2020	1.25	\$0	\$0
April 24, 2020	1.25	\$0	\$0
April 24, 2020	1.75	\$0	\$0
April 24, 2020	1	\$0	\$0
April 24, 2020	1.75	\$0	\$0
April 24, 2020	2.75	\$0	\$0
April 24, 2020	4	\$0	\$0
April 24, 2020	2	\$0	\$0
April 24, 2020	1.75	\$0	\$0
April 24, 2020	2	\$0	\$0
April 24, 2020	2.75	\$0	\$0
April 24, 2020	1.75	\$0	\$0
April 24, 2020	1.75	\$0	\$0
March 27, 2021	0.75	\$0	\$0
March 27, 2021	1	\$0	\$0
April 9, 2021	0.88	\$0	\$0
May 10, 2021	1.5	\$0	\$0
May 10, 2021	1	\$0	\$0

#### Frequency

Hailstorms occur frequently within Bossier Parish with an annual chance of occurrence calculated at 100% based on the records for the past 31 years (1990 - 2021). On the next page, [Figure 2-20](#) displays the density of hailstorm events in Bossier Parish, while [Figure 2-21](#) provides an overview of hailstorm size based on location.

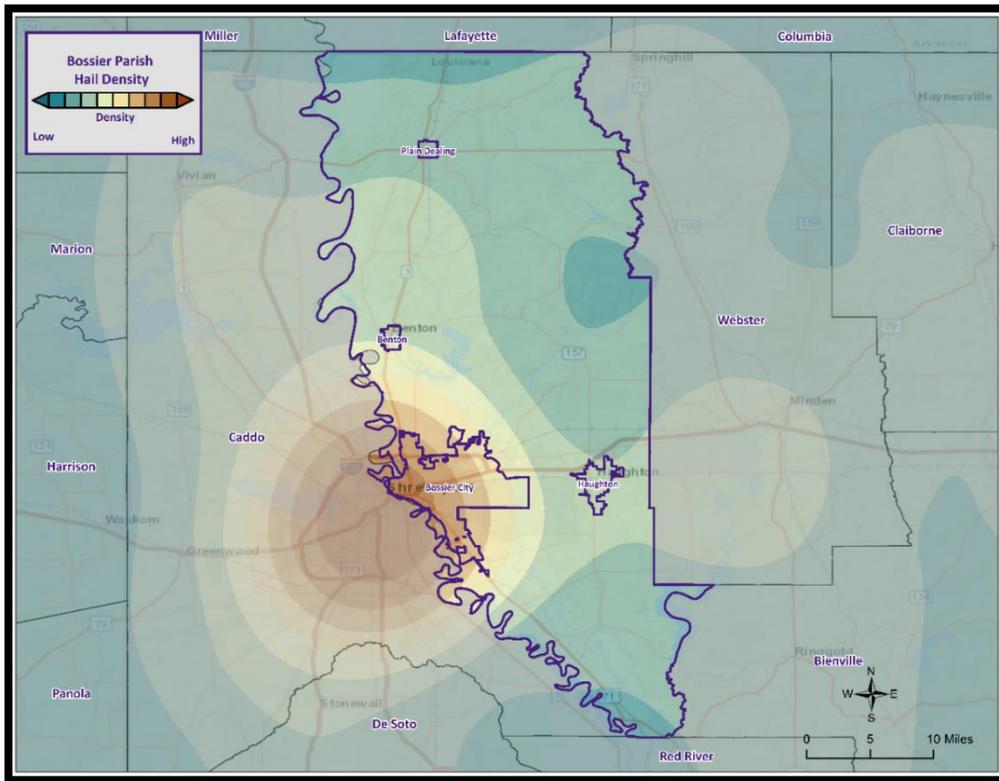


Figure 2-20: Density of Hailstorms by Diameter from 1950-2023.

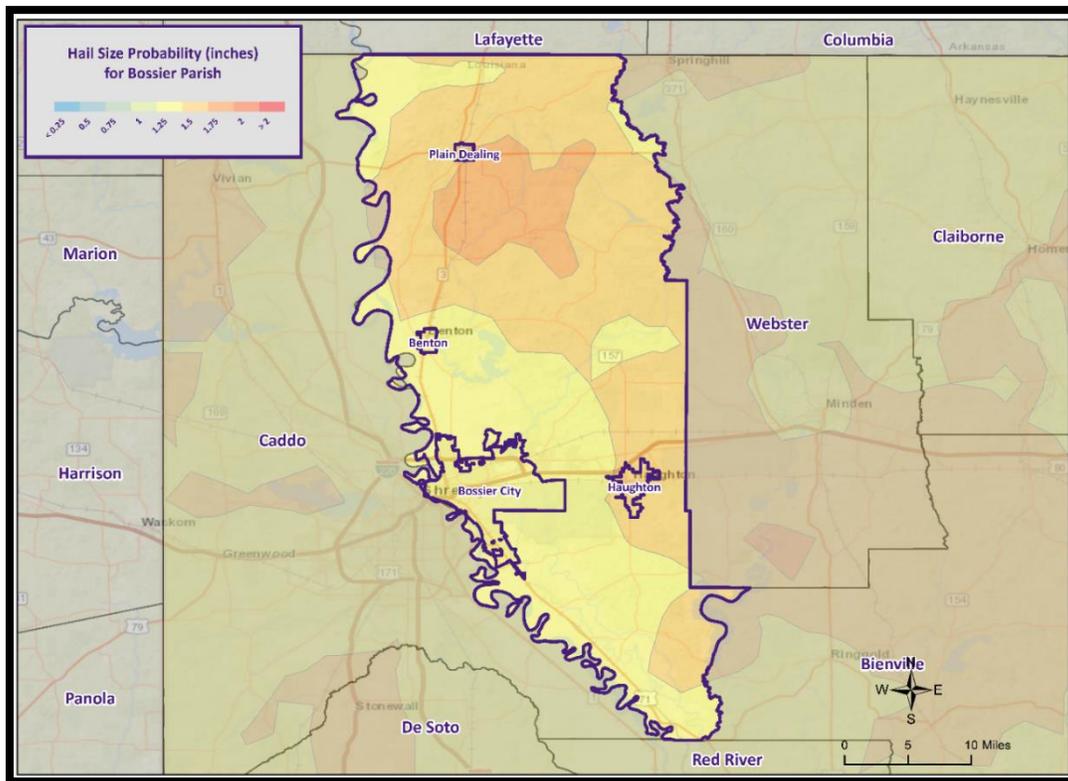


Figure 2-21: Hail Size Probability in Inches for Bossier Parish.

### Estimated Potential Losses

Since 1990, there have been 268 significant hail events that have resulted in property damages according to NCEI Storm Events Database. The total property damages associated with those storms have totaled approximately \$50,019,000. To estimate the potential losses of a hailstorm event on an annual basis, the total damages recorded for wind events was divided by the total number of years of available wind data in the NCEI Storm Events Database (1990 - 2021). This provides an annual estimated potential loss of \$1,613,516 and \$186,638 per event. The following table provides an estimate of potential property losses for Bossier Parish:

*Table 2-52: Estimated Annual Losses for Bossier Parish and its Jurisdictions Resulting from Hailstorms.*

Estimated Annual Losses for Hailstorms				
Unincorporated Area	Benton	Bossier City	Haughton	Plain Dealing
\$733,969	\$25,667	\$785,804	\$56,885	\$11,192

There have been no reported injuries or fatalities as a result of a hail events over the 31-year record.

### Vulnerability

See [Appendix C](#) for parish and municipality buildings that are susceptible to hailstorms.

### High Winds

#### Location

Because high winds are a meteorological phenomenon that can occur anywhere, the entire planning area for Bossier Parish is equally at risk from high winds. The worst-case scenario for thunderstorm high wind is wind speeds of approximately 106 mph.

### Previous Occurrences / Extents

Historically, there have been 336 thunderstorm high wind events in Bossier Parish. The high wind events have ranged in windspeeds from 57 mph to 106 mph per the National Climatic Data Center since 1990. Below is a brief synopsis of the events which have impacted Bossier Parish Planning area since the 2017 Bossier Parish HMP update.

*Table 2-53: Previous Occurrences for Thunderstorm High Wind Events since the 2017 Hazard Mitigation Plan Update.*

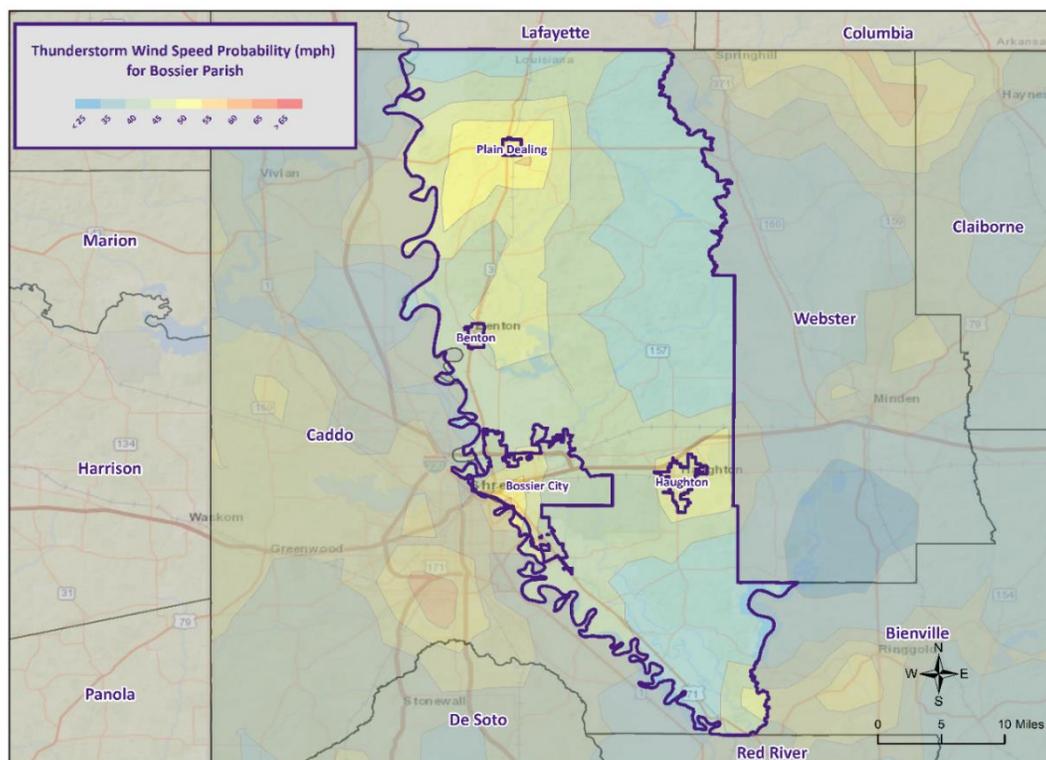
*(Source: NCEI Storm Events Database)*

Date	Wind Speed (mph)	Property Damage	Crop Damage
March 24, 2017	64	\$0	\$0
April 26, 2017	60	\$0	\$0
April 29, 2017	64	\$0	\$0
May 20, 2017	64	\$0	\$0
May 20, 2017	64	\$0	\$0
May 23, 2017	60	\$0	\$0
July 1, 2017	60	\$0	\$0
July 1, 2017	61	\$0	\$0
April 3, 2018	60	\$0	\$0
April 3, 2018	60	\$0	\$0

Date	Wind Speed (mph)	Property Damage	Crop Damage
May 25, 2018	62	\$0	\$0
July 27, 2018	70	\$0	\$0
July 29, 2018	64	\$0	\$0
July 29, 2018	60	\$0	\$0
July 29, 2018	64	\$0	\$0
August 9, 2018	49	\$500	\$0
December 27, 2018	70	\$0	\$0
December 27, 2018	70	\$0	\$0
December 27, 2018	70	\$0	\$0
March 9, 2019	75	\$0	\$0
June 19, 2019	70	\$0	\$0
June 19, 2019	60	\$0	\$0
June 19, 2019	100	\$0	\$0
June 23, 2019	64	\$0	\$0
June 23, 2019	64	\$0	\$0
June 23, 2019	64	\$0	\$0
September 9, 2019	60	\$0	\$0
September 9, 2019	60	\$0	\$0
October 20, 2019	81	\$0	\$0
October 20, 2019	81	\$0	\$0
January 11, 2020	100	\$0	\$0
January 11, 2020	105	\$1,300,000	\$0
January 11, 2020	59	\$0	\$0
January 11, 2020	81	\$0	\$0
April 12, 2020	64	\$0	\$0
April 12, 2020	85	\$0	\$0
April 12, 2020	64	\$0	\$0
April 12, 2020	70	\$0	\$0
April 22, 2020	64	\$0	\$0
April 29, 2020	60	\$0	\$0
May 8, 2020	60	\$0	\$0
May 26, 2020	75	\$0	\$0
September 28, 2020	64	\$0	\$0
September 28, 2020	64	\$0	\$0
May 4, 2021	64	\$0	\$0
May 25, 2021	64	\$0	\$0
May 28, 2021	59	\$0	\$0
May 28, 2021	90	\$0	\$0
June 7, 2021	70	\$0	\$0
November 11, 2021	75	\$0	\$0
November 11, 2021	70	\$0	\$0

### Frequency

High winds are a fairly common occurrence within Bossier Parish and its jurisdictions with an annual chance of occurrence calculated at 100% based on the records for the past 31 years (1990 - 2021). *Figure 2-22* displays the thunderstorm wind speed probability for Bossier Parish and its jurisdictions.



*Figure 2-22: Thunderstorm High Wind Speed Probability in Miles Per Hour for Bossier Parish.*

### Estimated Potential Losses

Since 1990, there has been 336 significant wind events that have resulted in property damages according to NCEI Storm Events Database. The total property damage associated with this storm totaled approximately \$3,079,000. To estimate the potential losses of a wind event on an annual basis, the total damages recorded for wind events was divided by the total number of years of available wind data in the NCEI Storm Events Database (1990 - 2021). This provides an annual estimated potential loss of \$99,323 and \$9,164 per event. The following table provides an estimate of potential property losses for Bossier Parish:

*Table 2-54: Estimated Annual Property Losses in Bossier Parish resulting from Wind Damage.*

Estimated Annual Losses for High Winds				
Unincorporated Area	Benton	Bossier City	Haughton	Plain Dealing
\$45,181	\$1,580	\$48,371	\$3,502	\$689

There have been no fatalities and two injuries as a result of a thunderstorm high wind event over the 31-year record.

### Vulnerability

See *Appendix C* for parish and municipality buildings that are susceptible to thunderstorm high winds.

## Lightning

### Location

Like hail and high winds, lightning is a meteorological phenomenon that can occur anywhere within the Bossier Parish planning area. The worst-case scenario for lightning events is a lightning activity level of 4 which is approximately 16 to 25 lightning strikes every 15 minutes.

### Previous Occurrences / Extent

Historically, there has been 20 lightning events in Bossier Parish and its jurisdictions between the years 1990 and 2021. Since the last HMP update, there have been no significant lightning events within the boundaries of Bossier Parish.

### Frequency

Lightning can strike anywhere and is produced by every thunderstorm, so the chance of lightning occurring in Bossier Parish is high. However, lightning that meets the definition that is used by the NCEI Storm Events Database that results in damages to property and injury or death to people is a less likely event. Bossier Parish experienced nine significant lightning events between the years 1990 and 2021 resulting in a 65% annual chance of occurrence.

### Estimated Potential Losses

Since 1990, there have been 20 significant lightning events that have resulted in property damages according to NCEI Storm Events Database. The total property damages associated with those storms have totaled approximately \$10,927,000. To estimate the potential losses of a lightning event on an annual basis, the total damages recorded for lightning events was divided by the total number of years of available lightning data in the NCEI Storm Events Database (1990 - 2021). This provides an annual estimated potential loss of \$352,484 and \$546,350 per event. The following tables provide an estimate of potential property losses for Bossier Parish:

*Table 2-55: Estimated Annual Property Losses in Bossier Parish resulting from Lightning Damage.*

Estimated Annual Losses for Lightning				
Unincorporated Area	Benton	Bossier City	Haughton	Plain Dealing
\$160,341	\$5,607	\$171,664	\$12,427	\$2,445

Per the NCEI Storm Events Database, there have been no fatalities and three injuries as a result of lightning in Bossier Parish.

### Vulnerability

See [Appendix C](#) for parish and municipality building exposure to lightning hazards.

## Tornadoes

Tornadoes (also called twisters and cyclones) are rapidly rotating funnels of wind extending between storm clouds and the ground. For their size, tornadoes are the most severe storms, and 70% of the world's reported tornadoes occur within the continental United States, making them one of the most significant hazards Americans face. Tornadoes and waterspouts form during severe weather events, such as thunderstorms and hurricanes, when cold air overrides a layer of warm air, causing the warm air to rise rapidly, which usually occurs in a counterclockwise direction in the northern hemisphere. The updraft of air in tornadoes always rotates because of wind shear (differing speeds of moving air at various heights), and it can rotate in either a clockwise or counterclockwise direction; clockwise rotations (in the northern hemisphere) will sustain the system, at least until other forces cause it to die seconds to minutes later.

Since February 1, 2007, the Enhanced Fujita (EF) Scale has been used to classify tornado intensity. The EF Scale classifies tornadoes based on their damage pattern rather than wind speed; wind speed is then derived and estimated. This contrasts with the Saffir-Simpson scale used for hurricane classification, which is based on measured wind speed. *Table 2-56* shows the EF scale in comparison with the old Fujita (F) Scale, which was used prior to February 1, 2007. When discussing past tornadoes, the scale used at the time of the hazard is used. Damage and adjustment between scales can be made using the following tables.

*Table 2-56: Comparison of the Enhanced Fujita (EF) Scale to the Fujita (F) Scale.*

Wind Speed (mph)	Enhanced Fujita Scale					
	EF0	EF1	EF2	EF3	EF4	EF5
	65-85	86-110	111-135	136-165	166-200	>200
	Fujita Scale					
	F0	F1	F2	F3	F4	F5
	<73	73-112	113-157	158-206	207-260	>261

*Table 2-57: Fujita and Enhanced Fujita Tornado Damage Scale.*

Scale	Typical Damage
<b>F0/EF0</b>	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
<b>F1/EF1</b>	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
<b>F2/EF2</b>	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; light-object missiles generated; cars lifted off ground.
<b>F3/EF3</b>	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
<b>F4/EF4</b>	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
<b>F5/EF5</b>	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

The National Weather Service (NWS) has the ability to issue advisory messages based on forecasts and observations. The following are the advisory messages that may be issued with definitions of each:

- **Tornado Watch:** Issued to alert people to the possibility of a tornado developing in the area. A tornado has not been spotted but the conditions are favorable for tornadoes to occur.
- **Tornado Warning:** Issued when a tornado has been spotted or when Doppler radar identifies a distinctive “hook-shaped” area within a thunderstorm line.

Structures within the direct path of a tornado vortex are often reduced to rubble. Structures adjacent to the tornado’s path are often severely damaged by high winds flowing into the tornado vortex, known as inflow winds. It is here, adjacent to the tornado’s path, that the building type and construction techniques are critical to the structure’s survival. Although tornadoes strike at random, making all buildings vulnerable, mobile homes, homes on crawlspaces, and buildings with large spans are more likely to suffer damage.

The major health hazard from tornadoes is physical injury from flying debris or being in a collapsed building or mobile home. Within a building, flying debris or missiles are generally stopped by interior walls. However, if a building has no partitions, any glass, brick, or other debris blown into the interior is life threatening. Following a tornado, damaged buildings are a potential health hazard due to instability, electrical system damage, and gas leaks. Sewage and water lines may also be damaged.

Peak tornado activity in Louisiana occurs during the spring, as it does in the rest of the United States. Nearly one-third of observed tornadoes in the United States occur during April. About half of those in Louisiana, including many of the strongest, occur between March and June. Fall and winter tornadoes are less frequent, but the distribution of tornadoes throughout the year is more uniform in Louisiana than in locations farther north.

#### *Location*

While there is a significant tornado record in Bossier Parish with actual locations, tornadoes in general are a climatological based hazard and have the same approximate probability of occurring in Bossier Parish as all of its jurisdictions. Because a tornado has a similar probability of striking anywhere within the planning area for Bossier Parish, all areas in the parish are equally at risk for tornadoes.

#### *Previous Occurrences / Extent*

The NCEI Storm Events Database reports a total of 40 tornadoes or waterspouts occurring within the boundaries of Bossier Parish since 1990 ranging in extent from F1 to F4 under the Fujita Scale and EF0 to EF2 on the Enhanced Fujita Scale. Bossier Parish can expect future tornadoes up to an EF4 under the Enhanced Fujita Scale as a worst-case scenario.

The most destructive tornado to impact Bossier Parish was a F4 tornado which occurred on April 3, 1999. The F4 tornado impacted 389 structures in Bossier Parish with 227 of which suffered either major damage or total destruction. Roofs were missing from several homes and brick homes were leveled with on brick home totally missing, leaving only the slab. Numerous large oak and pine trees were uprooted or snapped near the bases. Seven people died from the tornado with another 90 injured. Since the 2017 HMP

Update, nine tornadoes have occurred within the boundaries of Bossier Parish. Below is a list and brief description of the impact for each event.

*Table 2-58: Historical Tornadoes in Bossier Parish with Locations since the 2017 Update.*

Date	Impacts	Property Damage	Location	Magnitude
<b>January 21, 2017</b>	8.56 mile path with a width of 990 yards. n EF-2 tornado with maximum estimated winds near 115 mph touched down just east of Plain Dealing along Pleasant Hill Cemetery Road where it uprooted numerous trees and downed power lines. This tornado crossed Highway 2 where it damaged several homes and two mobile homes were rolled and completely destroyed. One injury was reported when a resident was hit in the head by a flying piece of lumber rendering the resident briefly unconscious in a manufactured home that lost its roof. An adjacent exterior wall was removed with another pushed in. The worst structural damage was observed near and adjacent to Mott Road, with the tornado continuing northeast uprooting numerous trees and power lines along its track before entering Northwest Webster Parish.	\$800,000	ANTRIM	EF2
<b>April 13, 2018</b>	14.65 mile path with a width of 1100 yards. This EF-1 tornado, with estimated maximum winds near 110 mph, crossed the Red River into Downtown Bossier City, where it uprooted a number of trees and broke several large branches between Bossier High School and Interstate 20. Debris from this tornado also shattered the windows at Moffitt Mazda on Old Minden Road. The tornado strengthened near the Heart of Bossier Shopping Center and Benton Road where it uprooted several trees as it moved east northeast towards Pierre Bossier Mall. It uprooted or snapped several trees along the south side of the mall and Interstate 20 in this area. The tornado knocked down the top half of the east-facing wall of a strip mall on the north side of Pierre Bossier Mall. The tornado shifted northeast where it paralleled the north side of East Texas Street where it continued to uproot and snap trees. There were a number of mobile homes that were damaged along East Texas Street (Highway 80) due to falling trees. The tornado was at its weakest point when sporadic	\$3,000,000	BOSSIER CITY	EF1

Date	Impacts	Property Damage	Location	Magnitude
	<p>tree damage was found as it crossed over Interstate 220 near Louisiana Downs. The tornado began to rapidly strengthen as it approached the Red Chute community where it knocked a large tree down onto a travel trailer in the Hillcrest Mobile Home Park, unfortunately killing a two year-old infant. The tornado did considerable tree damage as it crossed Bellevue Road just north of Highway 80, splitting trunks and uprooting trees as it reached its widest width of 1100 yards. The tornado continued northeast paralleling Adner Road while doing significant tree damage in the northern sections of the Country Place Subdivision near the Eastwood community. Additional tree damage occurred as the tornado crossed Winfield Road west of the community of Princeton just west of Princeton Elementary School. The tornado uprooted a few more trees north of Princeton along Highway 157 before finally lifting.</p> <p>A total of 69 conventional and manufactured homes were affected by this tornado throughout Bossier Parish, with 25 of these classified as Affected, 33 with Minor Damage, 10 with Major Damage, and 1 as Destroyed.</p>			
<b>April 13, 2018</b>	<p>3.09 mile path with a width of 300 yards. An EF-0 tornado with estimated maximum winds near 80 mph touched down along Cozby Road just west of Highway 529 in far northeast Bossier Parish, and uprooted a number of trees near a cemetery along Highway 529 as it traveled northeast where it crossed Coile Road damaging several trees. The tornado then crossed Bodcau Road before moving over Bayou Bodcau into Northwestern Webster Parish.</p>	\$0	MOT	EF0
<b>March 9, 2019</b>	<p>2.87 mile path with a width of 100 yards. An EF-1 tornado with maximum estimated winds near 105 mph touched down in a heavily forested area southwest of the community of Carterville near the intersection of Highway 157 and Red Land Road. There, it completely destroyed a metal outbuilding and removed most of the roof of another outbuilding. The tornado then continued to snap and uproot numerous trees as it crossed Mott Road before lifting.</p>	\$25,000	REDLAND	EF1

Date	Impacts	Property Damage	Location	Magnitude
<b>June 19, 2019</b>	1.44 mile path with a width of 175 yards. An EF-2 tornado with maximum estimated winds near 130 mph was embedded in a line of severe thunderstorms, and touched down across a forested area northeast of Benton near Butler Hill Road. Based off of drone video, the tornado downed at least a couple hundred trees before it ripped most of the roof off of a two-story single family home, leaving only a small portion of the roof on the second story and the brick exterior walls on the first story standing. This was the worst damage from the tornado, resulting in a high end EF-2 rating. As the tornado continued on to cross Butler Hill Road, it downed and uprooted another couple hundred trees, with several falling on two separate single family homes. The tornado also damaged the roof of an outbuilding before moving on to uproot and snap several additional hardwood and softwood trees.	\$350,000	ALDEN BRIDGE	EF2
<b>December 16, 2019</b>	10.34 mile path with a width of 250 yards. An EF-1 tornado with estimated maximum winds near 110 mph touched down in Central Bossier Parish north of the Red Chute community on a private extension of Crouch Road on the edge of Bayou Bodcau. Here, the tornado did significant damage to a few metal sheds and downed numerous trees (including a few hardwoods), snapping and uprooting their trunks. The tornado then tracked northeast and crossed Bellevue Road and Highway 157 where the damage remained confined to trees. The tornado then paralleled, but remained just southeast of Cotton Valley Road, before it crossed International Paper Road, downing additional trees. The tornado then crossed over into Webster Parish. Although the higher tornadic winds were found in Central Webster Parish, estimated wind speeds from this EF-1 tornado throughout Bossier Parish consistently ranged from 90-100 mph.	\$20,000	LINTON	EF1
<b>January 11, 2020</b>	8.84 mile path with a width of 300 yards. After the tornado exited the corner of Barksdale Air Force Base, it strengthened south of Haughton to produce its most significant damage, completely destroying a single-wide manufactured home and a double-wide manufactured home off of Davis	\$500,000	SLIGO	EF2

Date	Impacts	Property Damage	Location	Magnitude
	Road. Two fatalities (a 79 year old male and his 65 year old wife) occurred in the double-wide with an additional fatality (an 87 year old male) occurring in the single-wide. The tornado continued to produce roof damage and uproot and snap trees which fell into homes in Eastern Bossier Parish, concentrated most along James Lane. The tornado continued moving northeast across Oliver Road and Camp Zion Road, where numerous trees were snapped and uprooted, while also removing siding off of a single-wide manufactured home, and ripping a portion of the metal exterior and doors off of the Bossier Parish Fire District 1 Station 6 building, as well as tearing off some vinyl siding to a mobile home living quarters located next door, before crossing over into Webster Parish.			
<b>April 12, 2020</b>	0.43 mile path with a width of 125 yards. An EF-1 tornado with estimated maximum winds near 105 mph touched down near Caddo Avenue south of 5th Street in the town of Benton. After initially touching down as an EF-0, this tornado strengthened as it crossed 5th Street between Sibley and Bossier Streets, before lifting east of Pine Street. Several buildings in town had roof damage, the feed store had its flat roof covering removed, and a single family home had a large porch dislodged with portions of its roof removed from the residence. The bay doors at Fire Station District 4 were also blown in.	\$150,000	BENTON	EF1
<b>April 7, 2021</b>	0.9 mile path with a width of 50 yards. A brief EF-1 tornado with estimated maximum winds around 100 mph touched down along Fairview Point Road, snapping a few trees. The tornado continued eastward, lifting a section of roofing material on a mobile home and snapping large tree limbs near the Pine Cove Marina before lifting near Lake Bistineau.	\$10,000	KORAN	EF1

#### *Frequency / Probability*

Tornadoes occur frequently within Bossier Parish and its jurisdictions with an annual chance of occurrence calculated at 100% based on the records for the past 31 years (1990 - 2021). On the next page, *Figure 2-23* displays the density of tornado touchdowns in Bossier Parish and neighboring parishes.

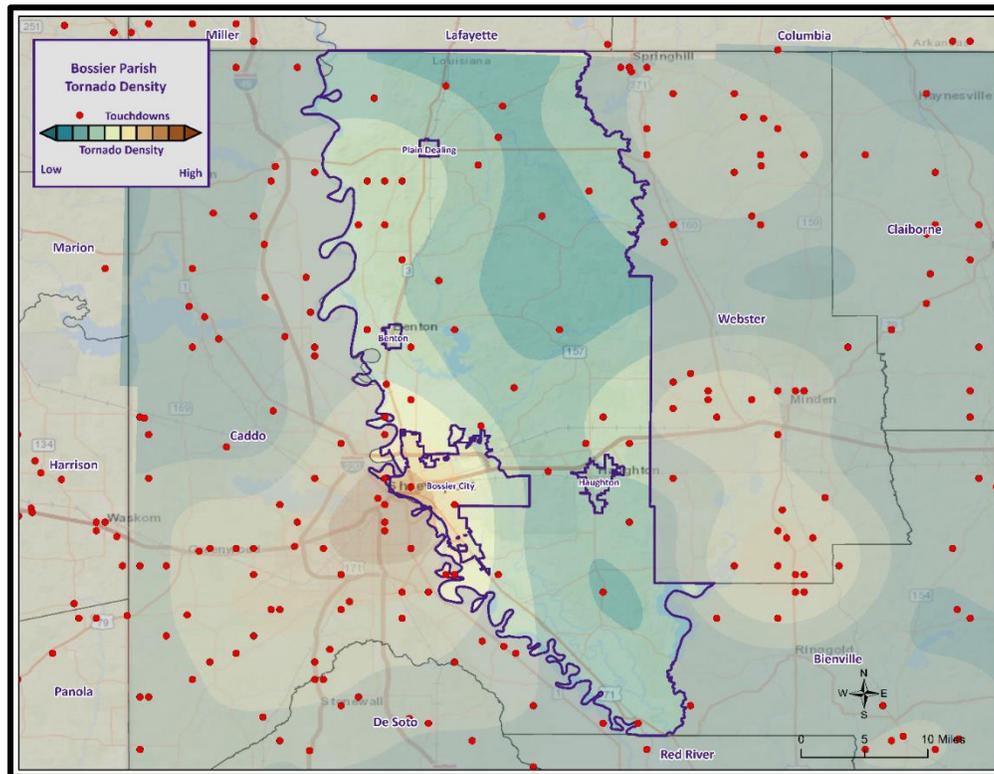


Figure 2-23: Location and Density of Tornadoes to Touchdown in Bossier Parish.  
(Source: NOAA/SPC Severe Weather Database)

#### Estimated Potential Losses

According to the NCEI Storm Events Database, there have been 40 tornadoes that have caused some level of property damage. The total damage from the actual claims for property is approximately \$28,021,000 with an average cost of \$700,525 per tornado event. When annualizing the total cost over the 31-year record, total annual losses based on tornadoes are estimated to be \$903,903. The following tables provide an annual estimate of potential losses for Bossier Parish.

Table 2-59: Estimated Annual Losses for Tornadoes in Bossier Parish.

Estimated Annual Losses for Tornadoes				
Unincorporated Area	Benton	Bossier City	Haughton	Plain Dealing
\$411,175	\$14,379	\$440,213	\$31,868	\$6,270

On the next page, *Table 2-60* presents an analysis of building exposure that are susceptible to tornadoes by general occupancy type for Bossier Parish along with the percentage of building stock that are mobile homes. On the next page,



The National Risk Index (NRI) includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the parish and Census tract level. The following table provides an overview of each category at the parish level for tornadoes.

*Table 2-61: National Risk Index (NRI) Summarization of Tornado Occurrences for the Parish  
(Source: National Risk Index)*

Expected Annual Losses	Overall Risk Rating
Relatively Moderate	Relatively Moderate

Tornadoes are inherently dangerous and pose risks to all populations in their path. Vulnerable populations, including low-income communities, those with limited access to shelter or adequate warning systems, and individuals with mobility or communication challenges, may face heightened risks during tornado events. These populations may have limited resources or support systems to effectively prepare for, respond to, and recover from tornadoes, increasing their vulnerability to the associated impacts.

Socioeconomic factors, such as housing quality, access to safe shelters, and the ability to afford insurance coverage, can significantly influence vulnerability to tornadoes. Climate change can indirectly impact vulnerable populations through its socioeconomic effects, such as shifts in employment patterns, changes in housing affordability, or the availability of resources for disaster preparedness and recovery. These factors can affect a community's ability to withstand tornado impacts and recover in the aftermath.

It is important to note that tornadoes are highly localized and short-lived events, making it challenging to draw direct links between climate change and their occurrence or impacts. However, addressing the broader impacts of climate change, such as strengthening disaster preparedness, improving early warning systems, promoting resilient infrastructure, and reducing socioeconomic vulnerabilities, can enhance the overall resilience of vulnerable populations to tornadoes and other severe weather events.

#### *Vulnerability*

See [Appendix C](#) for parish and municipality building exposure to tornadoes.

## Tropical Cyclones

Tropical cyclones are among the worst hazards Louisiana faces. These spinning, low-pressure air masses draw surface air into their centers and attain strength ranging from weak tropical waves to the most intense hurricanes. Usually, these storms begin as clusters of oceanic thunderstorms off the western coast of Africa, moving westward in the trade wind flow. The spinning of these thunderstorm clusters begins because of the formation of low pressure in a perturbation in the westerly motion of the storms associated with differential impacts of the Earth's rotation. The west-moving, counterclockwise-spinning collection of storms, now called a tropical disturbance, may then gather strength as it draws humid air toward its low-pressure center. This results in the formation of a tropical depression (defined when the maximum sustained surface wind speed is 38 mph or less), then a Tropical Cyclone (when the maximum sustained surface wind ranges from 39 mph to 73 mph), and finally a hurricane (when the maximum sustained surface wind speeds exceed 73 mph). The table below presents the Saffir-Simpson Hurricane Wind Scale, which categorizes tropical cyclones based on sustained winds.

*Table 2-62: Saffir-Simpson Hurricane Wind Scale.*

Saffir-Simpson Hurricane Wind Scale			
Category	Sustained Winds	Pressure	Types of Damage Due to Winds
Tropical Depression	<39 mph	N/A	N/A
Tropical Cyclone	39-73 mph	N/A	N/A
1	74-95 mph	>14.2 psi	Very dangerous winds will produce some damage. Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap, and shallow-rooted trees may be toppled, especially after the soil becomes waterlogged. Extensive damage to power lines and poles will likely result in power outages that could last several days.
2	96-110 mph	14-14.2 psi	Extremely dangerous winds will cause extensive damage. Well-constructed frame homes could sustain major roof and siding damage. Many shallow-rooted trees will be snapped or uprooted, especially after the soil becomes waterlogged, and block numerous roads. Near total power loss is expected, with outages that could last from several days to weeks.
3	111-129 mph	13.7 -14 psi	Devastating damage will occur. Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, especially after the soil becomes waterlogged, blocking numerous roads. Electricity and water may be unavailable for several days to weeks after the storm passes.
4	130-156 mph	13.3-13.7 psi	Catastrophic damage will occur. Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, especially after the soil becomes waterlogged, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 mph or higher	<13.7 psi	Catastrophic damage will occur. A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks to months.

Many associated hazards can occur during a hurricane, including heavy rains, flooding, high winds, and tornadoes. A general rule of thumb in coastal Louisiana is that the number of inches of rainfall to be expected from a tropical cyclone is approximately 100 divided by the forward velocity of the storm in mph; so, a fast-moving storm (20 mph) might be expected to drop five inches of rain while a slow-moving (5 mph) storm could produce totals of around 20 inches. However, no two storms are alike, and such generalizations have limited utility for planning purposes. Hurricane Beulah, which struck Texas in 1967, spawned 115 confirmed tornadoes. In recent years, extensive coastal development has increased the storm surge resulting from these storms so much that this has become the greatest natural hazard threat to property and loss of life in the state. Storm surge is a temporary rise in sea level generally caused by reduced air pressure and strong onshore winds associated with a storm system near the coast. Although storm surge can technically occur at any time of the year in Louisiana, surges caused by hurricanes can be particularly deadly and destructive. Such storm surge events are often accompanied by large, destructive waves (exceeding ten meters in some places) that can inflict a high number of fatalities and economic losses. In 2005, Hurricane Katrina clearly demonstrated the destructive potential of this hazard, as it produced the highest modern-day storm surge levels in the State of Louisiana, reaching up to 18.7 feet near Alluvial City in St. Bernard Parish.

Property can be damaged by the various forces that accompany a tropical cyclone. High winds can directly impact structures in three ways: wind forces, flying debris, and pressure. By itself, the force of the wind can knock over trees, break tree limbs, and destroy loose items, such as television antennas and power lines. Many things can be moved by high winds. As winds increase, so does the pressure against stationary objects. Pressure against a wall rises with the square of the wind speed. For some structures, this force is enough to cause failure. The potential for damage to structures is increased when debris breaks the building “envelope” and allows the wind pressure to impact all surfaces (the building envelope includes all surfaces that make up the barrier between the indoors and the outdoors, such as the walls, foundation, doors, windows, and roof). Mobile homes and buildings in need of maintenance are most subject to wind damage. High winds mean bigger waves. Extended pounding by waves can demolish any poorly or improperly designed structures. The waves also erode sand beaches, roads, and foundations. When foundations are compromised, the building will collapse.

Nine out of ten deaths during hurricanes are caused by storm surge flooding. Falling tree limbs and flying debris caused by high winds have the ability to cause injury or death. Downed trees and damaged buildings are a potential health hazard due to instability, electrical system damage, broken pipelines, chemical releases, and gas leaks. Sewage and water lines may also be damaged. Salt water and freshwater intrusions from storm surge send animals, such as snakes, into areas occupied by humans.

#### *Location*

Hurricanes are the single biggest threat to the state of Louisiana. With any single tropical cyclone event having the potential to devastate multiple parishes at once, tropical cyclones are a relatively significant threat to the entire Bossier Parish planning area. The worst-case scenario for a tropical cyclone event in Bossier Parish is a Category 1 Hurricane.

#### *Previous Occurrences / Extents*

Bossier Parish has experienced four major tropical cyclone events since 2002. The table on the next page provides a list of tropical cyclones which have impacted Bossier Parish since 2002.

*Table 2-63: Historical Tropical Cyclone Events in Bossier Parish from 2002 – 2021.*

Date	Name	Storm Type at Time of Impact
2005	Rita	Hurricane
2008	Gustav	Tropical Storm
2008	Ike	Tropical Storm
2020	Laura	Tropical Storm

Since the last Bossier Parish HMP update in 2017, there has been one tropical cyclone event which has impacted the parish. Below is a brief description of the event and the impact it had on Bossier Parish.

#### Tropical Storm Laura (2020)

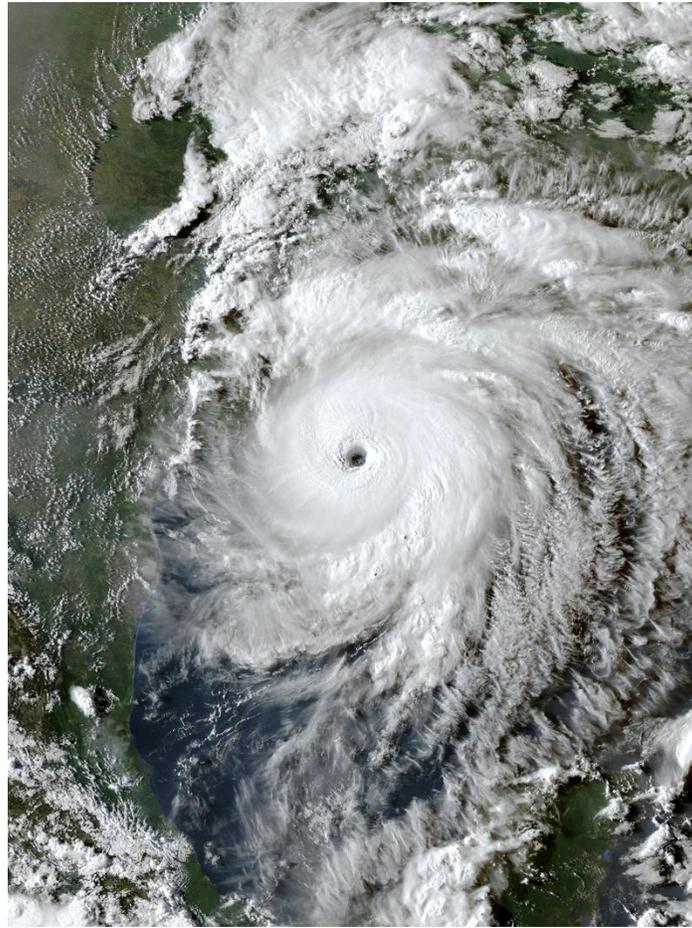
Laura began as a large tropical wave that emerged off the west coast of Africa on August 16<sup>th</sup>. The wave traversed the tropical Atlantic for the next several days with little additional organization. On August 19<sup>th</sup>, the system became better organized, closed off a low-level circulation, and subsequently the National Hurricane Center began issuing advisories on Tropical Depression Thirteen late that evening.

On the morning of August 21<sup>st</sup>, Tropical Depression Thirteen strengthened into Tropical Storm Laura, which was the earliest twelfth named Atlantic storm, beating the previous record of Hurricane Luis of 1995 by eight days. As Laura moved westward, little additional strengthening took place as the center moved over the northern Lesser Antilles later that evening, and south of Puerto Rico on August 22<sup>nd</sup>. Early on August 23<sup>rd</sup>, Tropical Storm Laura made landfall across Hispaniola, traversed the entire island, and made landfall across Eastern Cuba later that evening. Tropical Storm Laura continued west northwestward, traveling just south of the island with a second landfall across Western Cuba late on August 24<sup>th</sup>.

On August 25<sup>th</sup>, Laura entered the Gulf of Mexico and became a Category 1 hurricane at 10 AM CDT. Laura began to explosively intensify on August 26<sup>th</sup>, reaching category 2 by 1 AM CDT, category 3 by 7 AM CDT, and category 4 by 1 PM CDT. Laura reached a peak intensity of 150 mph (130 knots) and a minimum central pressure of 937 millibars (27.67 inches of mercury) by 8 PM CDT.

With little change in strength, Laura made landfall at Cameron, Louisiana around 1 AM CDT August 27<sup>th</sup>, with sustained winds of 150 mph (130 knots) and a minimum central pressure of 938 millibars (27.70 inches of mercury). Laura was the strongest hurricane to strike Southwest Louisiana since records began in 1851. Laura slowly weakened after landfall but maintained major hurricane status throughout its passage across Cameron, Calcasieu, and southern Beauregard Parishes, and category 2 status across northern Beauregard and Vernon parishes as daybreak approached on August 27<sup>th</sup>. Laura finally weakened below hurricane strength by Noon as it was crossing I-20 in North Louisiana. With this being the strongest hurricane to affect Southwest Louisiana, wind damage to buildings and trees was major to catastrophic across Cameron and Calcasieu parishes, with considerable damage across Beauregard and Vernon parishes where the core of the hurricane passed.

The National Weather Service in Lake Charles, Louisiana recorded a station record highest peak wind gust of 116 knots (133 mph) at 1:42 AM CDT before the Automated Surface Observing System (ASOS) wind equipment failed. However, the ASOS barometer sensor that was safely within the NWS building (which received very little damage) recorded a station record minimum sea level pressure of 956 millibars (28.23 inches of mercury) at 2:20 AM CDT when the eye of Hurricane Laura passed nearly overhead.



*Figure 2-25: Hurricane Laura in the Gulf Coast Area.  
(Source: NOAA)*

A total of 33 fatalities occurred throughout the state with four of them coming from falling trees. They included a 14-year-old girl in Vernon Parish, a 68-year-old man in Acadia Parish, a 51-year-old man in Jackson Parish, and a 64-year-old man in Allen Parish. Carbon monoxide poisoning from generators being inside homes, which is strongly discouraged, led to the deaths of twelve people in Calcasieu Parish and two people in Allen Parish. Another man died of drowning while aboard a sinking boat during the storm. Finally, one person died in Calcasieu Parish in a house fire, four people died in Calcasieu Parish, Natchitoches Parish, and Bossier Parish during the cleanup process, and eight others died in Beauregard Parish, Grant Parish, Bossier Parish, and Vernon Parish due to heat-related illnesses following the loss of electricity.

In Bossier Parish, numerous trees and power lines were downed throughout the parish. Several homes were sporadically damaged across the parish from fallen trees.

The figure on the next page displays the wind zones that affect Bossier Parish in relation to critical facilities throughout the parish.

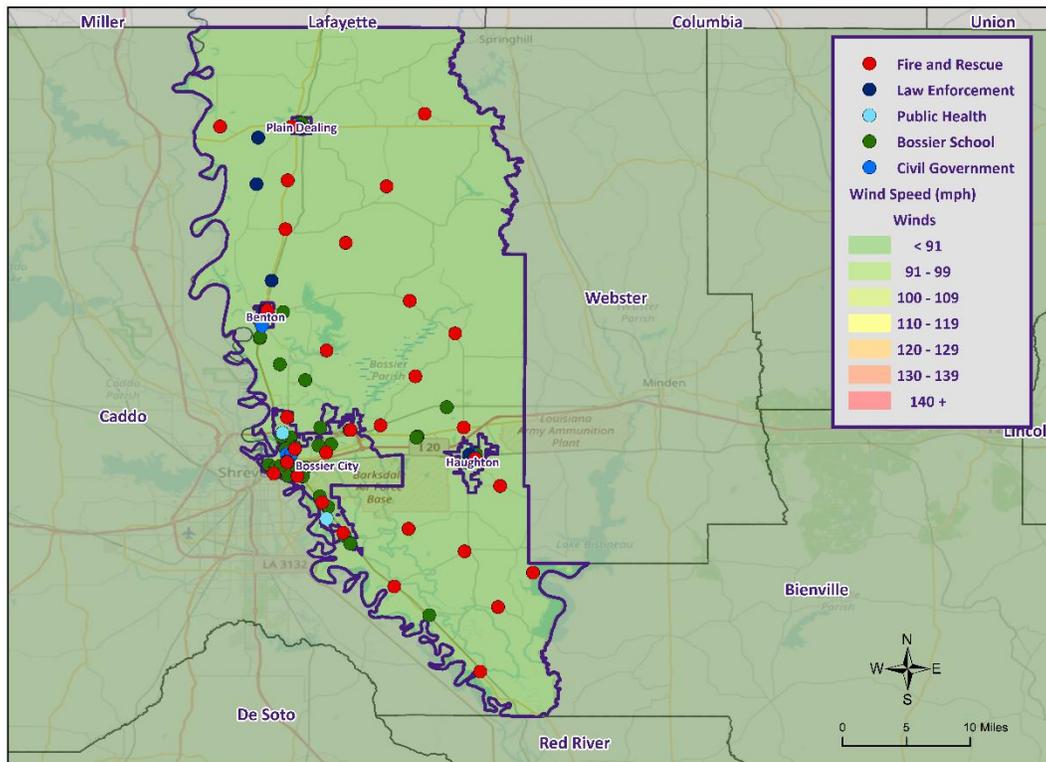


Figure 2-26: Winds Zones for Bossier Parish in Relation to Critical Facilities

*Frequency / Probability*

Tropical cyclones are large natural hazard events that regularly impact Bossier Parish. The annual chance of occurrence for a tropical cyclone is estimated at 21% for Bossier Parish with four events occurring within 19 years (2002 to 2021). The tropical cyclone season for the Atlantic Basin is from June 1st through November 30<sup>th</sup>, with most of the major hurricanes (Saffir-Simpson Categories 3, 4, & 5) occurring between the months of August and October. Based on geographical location alone Bossier Parish and its jurisdictions are highly vulnerable to tropical cyclones. This area has experienced several tropical cyclone events in the past and can expect more in the future.

*Estimated Potential Losses*

Using Hazus 100-Year Hurricane Model, the 100-year hurricane scenario was analyzed to determine losses from this worst-case scenario. The following table shows the total economic losses that would result from this occurrence.

Table 2-64: Total Estimated Losses for a 100-Year Hurricane Event  
(Source: Hazus)

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event
Unincorporated Bossier Parish	\$1,679,633
Benton	\$58,736
Bossier City	\$1,798,252
Haughton	\$130,178
Plain Dealing	\$25,611
<b>Total</b>	<b>\$3,692,410</b>

Total losses from a 100-year hurricane event for Bossier Parish were compared with the total value of assets to determine the ratio of potential damage to total inventory in the table below.

*Table 2-65: Ratio of Total Losses to Total Estimated Value of Assets for Bossier Parish  
(Source: Hazus)*

Jurisdiction	Estimated Total Losses from 100-Year Hurricane Event	Total Estimated Value of Assets	Ratio of Estimated Losses to Total Value
<b>Unincorporated Bossier Parish</b>	\$1,679,633	\$8,938,962,000	< 0.1%
<b>Benton</b>	\$58,736	\$246,355,000	< 0.1%
<b>Bossier City</b>	\$1,798,252	\$8,752,916,000	< 0.1%
<b>Houghton</b>	\$130,178	\$122,140,000	0.1%
<b>Plain Dealing</b>	\$25,611	\$110,897,000	< 0.1%

Based on the Hazus Hurricane Model, estimated total losses for Bossier Parish and its jurisdictions was less than 0.1% to 0.1% of the total estimated value of all assets.

The Hazus Hurricane Model also provides a breakdown for seven primary sectors (Hazus occupancy) throughout the parish. The losses for Bossier Parish by sector are listed in the tables below.

*Table 2-66: Estimated Losses in Unincorporated Bossier Parish for a 100-Year Hurricane Event  
(Source: Hazus)*

Unincorporated Bossier Parish	Estimated Total Losses from 100-Year Hurricane Event
<b>Agricultural</b>	\$0
<b>Commercial</b>	\$89
<b>Government</b>	\$0
<b>Industrial</b>	\$0
<b>Religious / Non-Profit</b>	\$0
<b>Residential</b>	\$1,679,544
<b>Schools</b>	\$0
<b>Total</b>	<b>\$1,679,633</b>

*Table 2-67: Estimated Losses in Benton for a 100-Year Hurricane Event  
(Source: Hazus)*

Benton	Estimated Total Losses from 100-Year Hurricane Event
<b>Agricultural</b>	\$0
<b>Commercial</b>	\$3
<b>Government</b>	\$0
<b>Industrial</b>	\$0
<b>Religious / Non-Profit</b>	\$0
<b>Residential</b>	\$58,733
<b>Schools</b>	\$0
<b>Total</b>	<b>\$58,736</b>

*Table 2-68: Estimated Losses in Bossier City for a 100-Year Hurricane Event  
(Source: Hazus)*

<b>Bossier City</b>	<b>Estimated Total Losses from 100-Year Hurricane Event</b>
Agricultural	\$0
Commercial	\$95
Government	\$0
Industrial	\$0
Religious / Non-Profit	\$0
Residential	\$1,798,157
Schools	\$0
<b>Total</b>	<b>\$1,798,252</b>

*Table 2-69: Estimated Losses in Haughton for a 100-Year Hurricane Event  
(Source: Hazus)*

<b>Haughton</b>	<b>Estimated Total Losses from 100-Year Hurricane Event</b>
Agricultural	\$0
Commercial	\$7
Government	\$0
Industrial	\$0
Religious / Non-Profit	\$0
Residential	\$130,171
Schools	\$0
<b>Total</b>	<b>\$130,178</b>

*Table 2-70: Estimated Losses in Plain Dealing for a 100-Year Hurricane Event  
(Source: Hazus)*

<b>Plain Dealing</b>	<b>Estimated Total Losses from 100-Year Hurricane Event</b>
Agricultural	\$0
Commercial	\$1
Government	\$0
Industrial	\$0
Religious / Non-Profit	\$0
Residential	\$25,610
Schools	\$0
<b>Total</b>	<b>\$25,611</b>

*Threat to People*

The total population within the parish that is susceptible to a tropical cyclone hazard is shown in the table below:

*Table 2-71: Number of People Susceptible to a 100-Year Hurricane Event in Bossier Parish  
(Source: Hazus)*

<b>Number of People Exposed to Hurricane Hazards</b>			
<b>Location</b>	<b># in Community</b>	<b># in Hazard Area</b>	<b>% in Hazard Area</b>
<b>Unincorporated Bossier Parish</b>	58,565	58,565	100%
<b>Benton</b>	2,048	2,048	100%
<b>Bossier City</b>	62,701	62,701	100%
<b>Haughton</b>	4,539	4,539	100%
<b>Plain Dealing</b>	893	893	100%
<b>Total</b>	<b>131,613</b>	<b>131,613</b>	<b>100%</b>

The Hazus hurricane model was also extrapolated to provide an overview of vulnerable populations throughout Bossier Parish. These populations are illustrated in the following tables:

*Table 2-72: Vulnerable Populations in Unincorporated Bossier Parish for a 100-Year Hurricane Event  
(Source: Hazus)*

<b>Unincorporated Bossier Parish</b>		
<b>Category</b>	<b>Total Numbers</b>	<b>Percentage of People in Hazard Area</b>
<b>Number in Hazard Area</b>	58,565	100.0%
<b>Persons Under 5 Years</b>	4,041	6.9%
<b>Persons Under 18 Years</b>	14,524	24.8%
<b>Persons 65 Years and Over</b>	8,258	14.1%
<b>White</b>	36,870	63.0%
<b>Minority</b>	21,695	37.0%

*Table 2-73: Vulnerable Populations in Benton for a 100-Year Hurricane Event  
(Source: Hazus)*

<b>Benton</b>		
<b>Category</b>	<b>Total Numbers</b>	<b>Percentage of People in Hazard Area</b>
<b>Number in Hazard Area</b>	2,048	100.0%
<b>Persons Under 5 Years</b>	193	9.4%
<b>Persons Under 18 Years</b>	422	20.6%
<b>Persons 65 Years and Over</b>	281	13.7%
<b>White</b>	1,116	54.5%
<b>Minority</b>	932	45.5%

*Table 2-74: Vulnerable Populations in Bossier City for a 100-Year Hurricane Event  
(Source: Hazus)*

Bossier City		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	62,701	100.0%
Persons Under 5 Years	4,514	7.2%
Persons Under 18 Years	14,797	23.6%
Persons 65 Years and Over	9,280	14.8%
White	33,043	52.7%
Minority	29,658	47.3%

*Table 2-75: Vulnerable Populations in Haughton for a 100-Year Hurricane Event  
(Source: Hazus)*

Haughton		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	4,539	100.0%
Persons Under 5 Years	300	6.6%
Persons Under 18 Years	1,235	27.2%
Persons 65 Years and Over	336	7.4%
White	3,218	70.9%
Minority	1,321	29.1%

*Table 2-76: Vulnerable Populations in Plain Dealing for a 100-Year Hurricane Event  
(Source: Hazus)*

Plain Dealing		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	893	100.0%
Persons Under 5 Years	28	3.1%
Persons Under 18 Years	112	12.5%
Persons 65 Years and Over	225	25.2%
White	447	50.1%
Minority	446	49.9%

#### *Impacts of Climate Change*

Climate change has the potential to alter the prevalence and severity of extreme incidents such as tropical cyclones within Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing. Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing are expected to experience more days with temperatures above 95°F this century which means an increase in sea surface and ambient temperatures, alterations in the hydrological cycle, and an increase in sea level which

collectively may increase the frequency of large storm incidents and impacts. Research indicates that the warming climate will increase the frequency of Category 4 and 5 hurricanes but decrease the frequency of less severe tropical cyclone incidents by the end of the century. This increase in the frequency of Category 4 and 5 hurricanes will lead to an increase in damage to the built environment and increased negative effects on the economy and ecosystem.

The National Risk Index (NRI) includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the parish and Census tract level. The following table provides an overview of each category at the parish level for tropical cyclones.

*Table 2-77: National Risk Index (NRI) Summarization of Tropical Cyclones Occurrences for the Parish  
(Source: National Risk Index)*

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Tropical cyclones can cause severe damage to infrastructure, including power grids, communication networks, and transportation systems. Climate change may exacerbate these impacts, affecting the ability of vulnerable populations to access critical services and support systems during and after a storm. Disruptions in healthcare facilities, emergency response services, and other essential infrastructure can further increase the vulnerability of impacted communities.

Vulnerable populations are often disproportionately affected by tropical cyclones and may face challenges in coping with the aftermath of a storm. The destruction of homes, loss of livelihoods, and displacement can lead to social disruption and exacerbate existing socioeconomic disparities. Vulnerable communities may struggle to recover and rebuild, facing prolonged periods of economic hardship and increased vulnerability to subsequent storms.

Addressing the impacts of tropical cyclones on vulnerable populations requires a comprehensive approach, including:

- Strengthening early warning systems and disaster preparedness to ensure timely evacuation and reduce loss of life.
- Investing in resilient infrastructure, including building codes, to withstand the impacts of tropical cyclones, such as strong winds, storm surge, and heavy rainfall.
- Enhancing access to safe shelters and evacuation routes for vulnerable populations, including those with mobility challenges or limited resources.
- Implementing climate change adaptation strategies, such as coastal zone management and ecosystem restoration, to reduce the vulnerability of coastal communities to storm impacts.
- Improving post-disaster recovery and support systems to facilitate the long-term recovery and resilience of vulnerable populations.
- Addressing socioeconomic disparities and promoting equitable access to resources and support systems to enhance the resilience of vulnerable communities to tropical cyclones.

#### *Vulnerability*

See [Appendix C](#) for parish and municipality buildings that are susceptible to tropical cyclones.

## Wildfires

A wildfire is combustion in a natural setting, marked by flames or intense heat. Most frequently wildfires are ignited by lightning or unintentionally by humans. Fires set purposefully (but lawfully) are referred to as controlled fires or burns. There are three different types of wildfires. (1) **Ground fires** burn primarily in the thick layers of organic matter directly on the forest floor and even within the soil. Ground fires destroy root networks, peat, and compact litter. These fires spread extremely slowly and can smolder for months. (2) **Surface fires** burn litter and vegetative matter in the underbrush of a forest. (3) **Crown fires** spread rapidly by wind and move quickly by jumping along the tops of trees. There are two types of crown fires— (a) passive (or dependent) crown fires rely on heat transfer from surface fire, whereas (b) active (or independent) crown fires do not require any heat transfer from below. Active crown fires tend to occur with greater tree density and drier conditions. A firestorm is a mass, crown fire (also called a running crown fire, area fire, or conflagration). They are large, continuous, intense fires that lead to violent convection. They are characterized by destructively violent surface in-drafts near and beyond their perimeter. Crown fires are the most damaging and most difficult to contain. The intensity of crown fires enables the fire to produce its own wind gusts. These so-called fire whirls can move embers ahead of the fire front and ignite new fires. Fire whirls are spinning vortex columns of ascending hot air and gases rising from the fire. Large fire whirls have the intensity of a small tornado.

The conditions conducive to the occurrence of wildfires are not distributed equally across the United States. Wildfires have a much greater likelihood of occurring in the western part of the country. Although less frequent than in other areas, wildfires do occur in Louisiana. Wildfire danger can vary greatly season to season and is exacerbated by dry weather conditions. Factors that increase susceptibility to wildfires are the availability of fuel (e.g., litter and debris), topography (i.e., slope and elevation affect various factors like precipitation, fuel amount, and wind exposure), and specific meteorological conditions (e.g., low rainfall, high temperatures, low relative humidity, and winds). The potential for wildfire is often measured by the Keetch–Byram Drought Index (KBDI), which represents the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in the soil. The KBDI tries to measure the amount of precipitation needed to return soil to its full field capacity, with KBDI values ranging from 0 (moist soil) to 800 (severe drought).

According to the State of Louisiana Forestry Division, most forest fires in Louisiana are caused by intentional acts (arson) or carelessness and negligence committed by people, exacerbated by human confrontation with nature. The wildland–urban interface is the area in which development meets wildland vegetation, where both vegetation and the built environment provide fuel for fires. As development near wildland settings continues, more people and property are exposed to wildfire danger.

The Southern Group of State Foresters developed the Southern Wildfire Risk Assessment Portal to create awareness among the public and government sectors about the threat of wildfires in their areas. The Southern Wildfire Assessment Portal allows users to identify areas that are most prone to wildfires. The table on the next page summarizes the intensity levels assigned to areas in the Southern Wildfire Assessment Portal.

Table 2-78: Southern Group of State Foresters Wildfire Risk Assessment Fire Intensity Scale.  
(Source: Southern Wildfire Assessment Portal)

Fire Intensity	
Level	Definition
1	Lowest Intensity: Minimal direct wildfire impacts. Location has a minimal chance of being directly impacted by a wildfire.
2	Low Intensity: Small flames usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress.
3	Moderate Intensity: Flames up to eight feet in length; short-range spotting is possible.
4	High Intensity: Large flames up to 30 feet in length; short-range spotting common; medium range spotting possible.
5	Highest Intensity: Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire induced winds.

#### Location

Wildfires impact areas that are populated with forests and grasslands. The worse-case scenario for Bossier Parish is a level 5; Benton and Bossier City a level 2.5; Houghton a level 4; and Plain Dealing a level 2. The following figure displays the areas of wildland-urban interface and intermix in Bossier Parish and its jurisdictions.

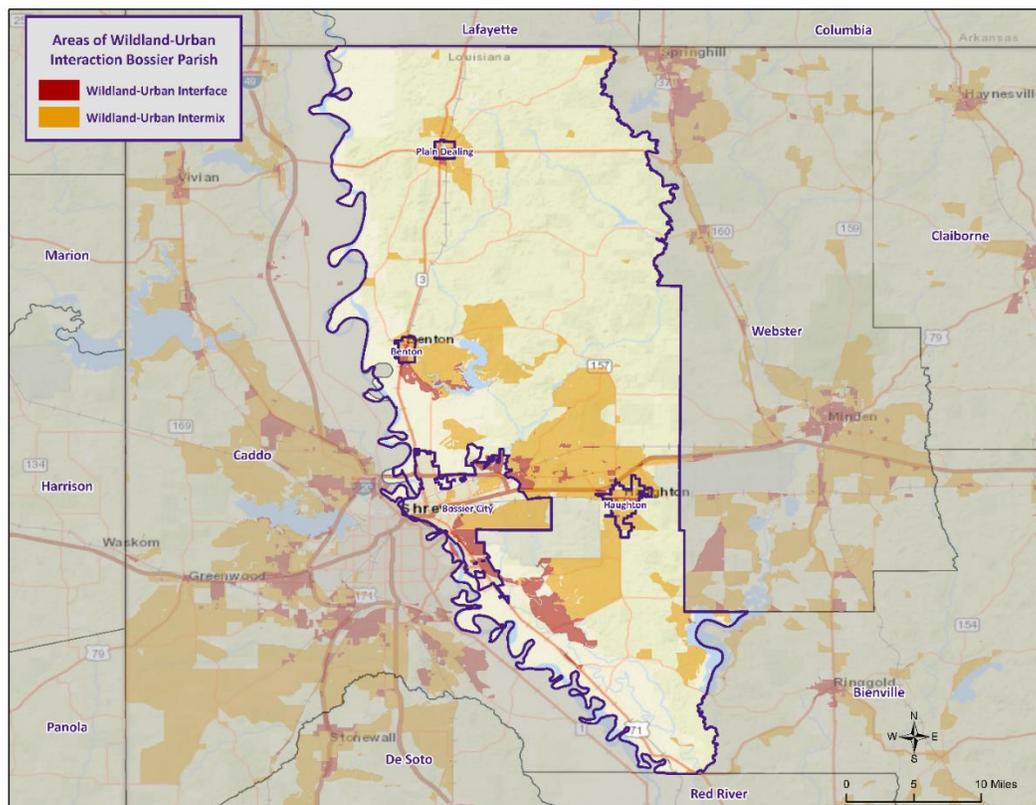


Figure 2-27: Wildland-Urban Interaction in Bossier Parish.

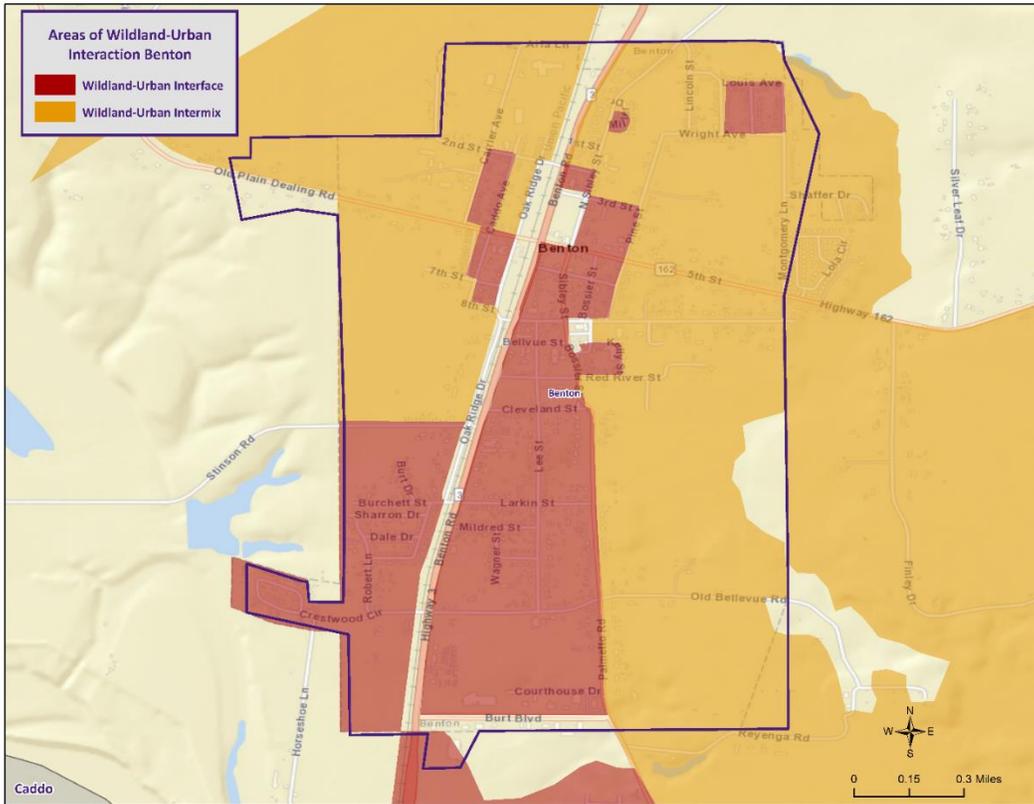


Figure 2-28: Wildland-Urban Interaction in Benton.

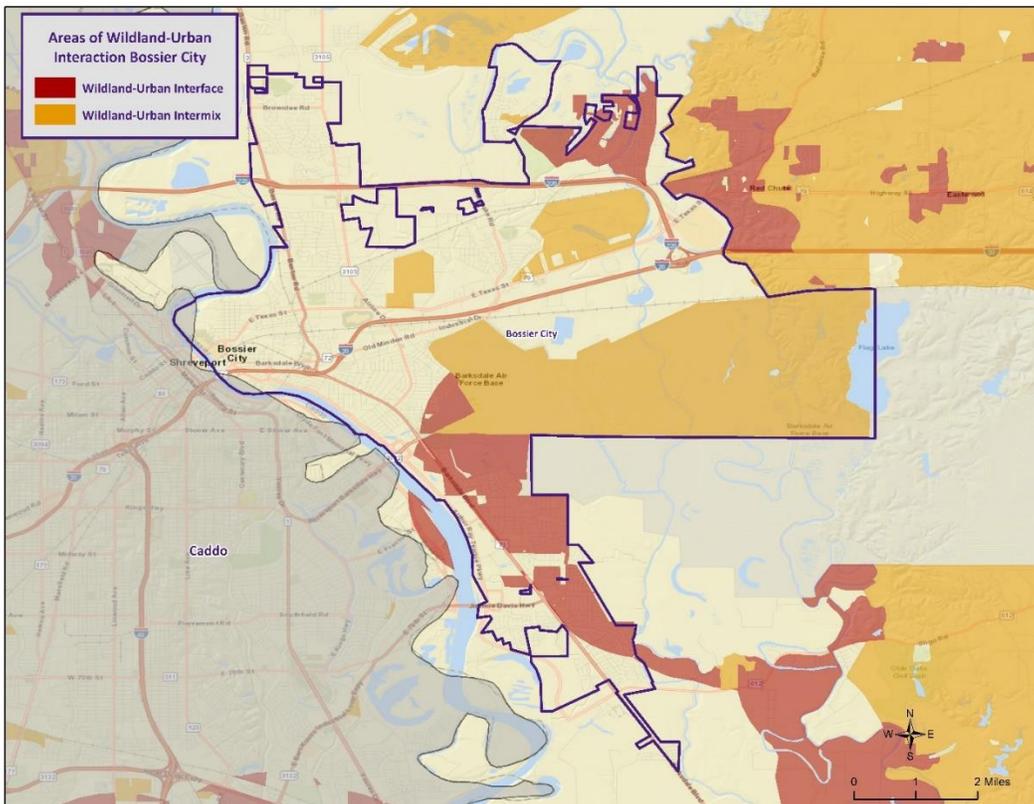


Figure 2-29: Wildland-Urban Interaction in Bossier City.

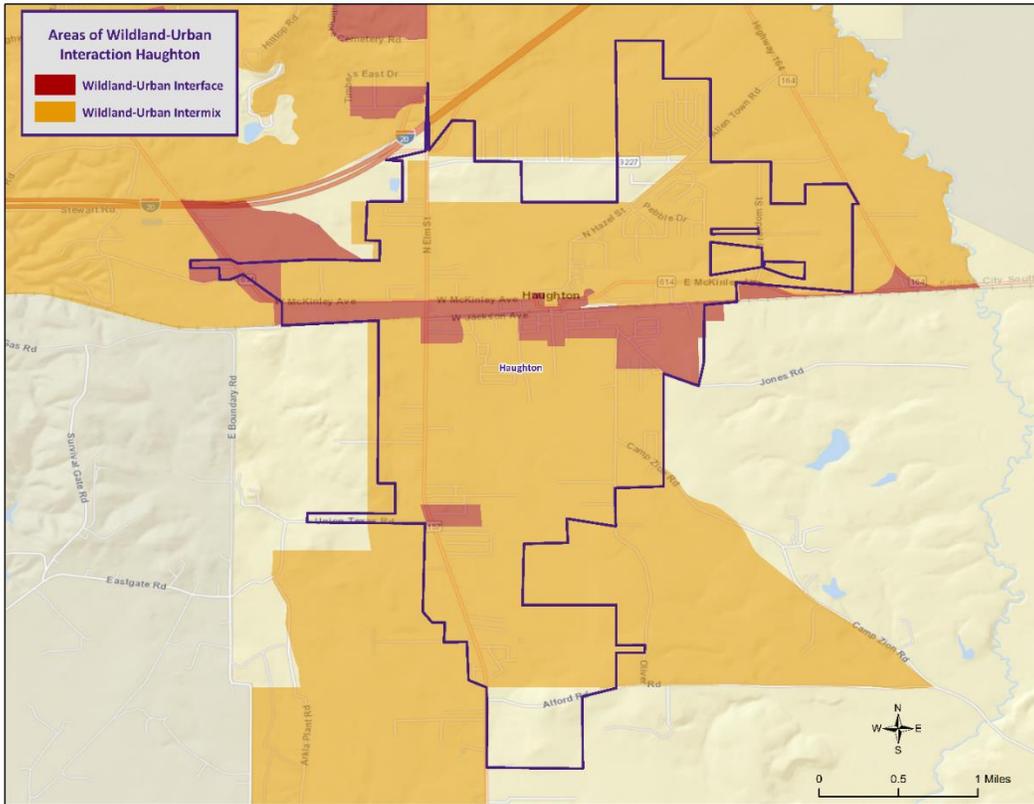


Figure 2-30: Wildland-Urban Interaction in Haughton.

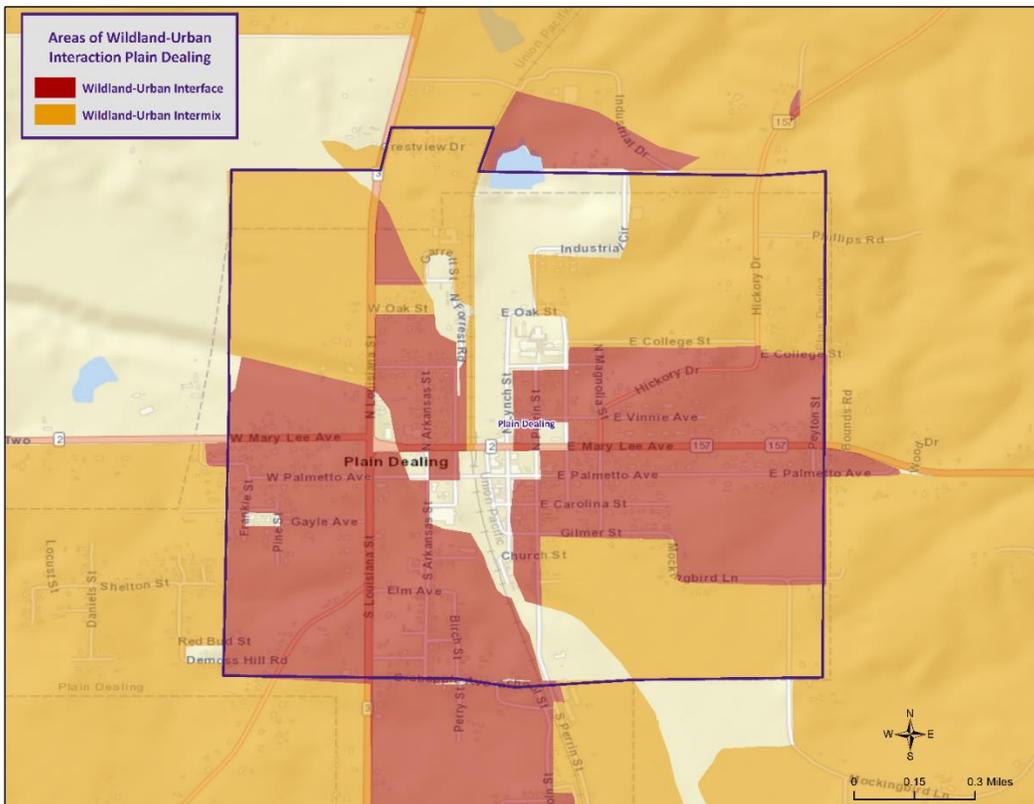


Figure 2-31: Wildland-Urban Interaction in Plain Dealing.

*Previous Occurrences / Extents*

The NCEI Storm Events database reports no wildfire events having occurred within the boundaries of Bossier Parish between the years 1990 and 2022.

Based on the Southern Group of State Foresters Risk Assessment Portal, the following table outlines the intensity that each jurisdictional area within Bossier Parish could potential experience due to a wildfire event.

*Table 2-79: Potential Wildfire Intensity Levels for Bossier Parish.  
(Source: Southern Wildfire Assessment Portal)*

Fire Intensity	
<b>Unincorporated Bossier Parish</b>	High Intensity Level 5
<b>Benton</b>	Low to Moderate Intensity Level 2.5
<b>Bossier City</b>	Low to Moderate Intensity Level 2.5
<b>Haughton</b>	High Intensity Level 4
<b>Plain Dealing</b>	Low Intensity Level 2

*Frequency / Probability*

Based on historical records, there have been no significant wildfire events within the boundaries of Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing; therefore, the annual chance of occurrence for wildfires is estimated at less than 1%.

*Estimated Potential Loses*

According to the NCEI Storm Events database, there have been no wildfire events which have caused property damage, crop damage, injuries, or fatalities in Bossier Parish and its jurisdictions. In assessing over risk to population, the most vulnerable population throughout the parish consists of those residing in areas of wildland-urban interaction.

Using Hazus, along with wildland-urban interaction areas, the following table presents an analysis of total building exposure that is located within the wildland-urban interaction areas.

*Table 2-80: Total Building Exposure by Wildland-Urban Interaction Areas.  
(Source: Hazus)*

Jurisdiction	Estimated Total Building Exposure
<b>Unincorporated Bossier Parish</b>	\$6,199,543,000
<b>Benton</b>	\$269,250,000
<b>Bossier City</b>	\$3,998,745,000
<b>Haughton</b>	\$152,836,000
<b>Plain Dealing</b>	\$114,516,000
<b>Total</b>	<b>\$10,734,890,000</b>

Hazus also provides a breakdown by jurisdiction for seven primary sectors (Hazus occupancy) throughout the parish. Utilizing this information with the wildland-urban interaction areas allows for identifying the total exposure by jurisdiction. The total exposure for each jurisdiction by sector is listed in the following tables. These sectors are comprised of privately owned structures/facilities, as well as locally, state, and federally owned structures/facilities.

*Table 2-81: Estimated Exposure for Unincorporated Bossier Parish by Sector.  
(Source: Hazus)*

Unincorporated Bossier Parish	Estimated Total Building Exposure by Sector
Agricultural	\$20,404,000
Commercial	\$540,837,000
Government	\$11,586,000
Industrial	\$170,574,000
Religious / Non-Profit	\$107,842,000
Residential	\$5,315,459,000
Schools	\$32,841,000
<b>Total</b>	<b>\$6,199,543,000</b>

*Table 2-82: Estimated Exposure for Benton by Sector.  
(Source: Hazus)*

Benton	Estimated Total Building Exposure by Sector
Agricultural	\$2,036,000
Commercial	\$37,362,000
Government	\$64,243,000
Industrial	\$3,218,000
Religious / Non-Profit	\$9,480,000
Residential	\$149,649,000
Schools	\$3,262,000
<b>Total</b>	<b>\$269,250,000</b>

*Table 2-83: Estimated Exposure in Bossier City by Sector.  
(Source: Hazus)*

Bossier City	Estimated Total Building Exposure by Sector
Agricultural	\$8,564,000
Commercial	\$514,869,000
Government	\$43,218,000
Industrial	\$86,276,000
Religious / Non-Profit	\$50,970,000
Residential	\$3,267,441,000
Schools	\$27,407,000
<b>Total</b>	<b>\$3,998,745,000</b>

Table 2-84: Estimated Exposure in Haughton by Sector.  
(Source: Hazus)

Haughton	Estimated Total Building Exposure by Sector
Agricultural	\$262,000
Commercial	\$13,068,000
Government	\$2,243,000
Industrial	\$726,000
Religious / Non-Profit	\$6,406,000
Residential	\$128,899,000
Schools	\$1,232,000
<b>Total</b>	<b>\$152,836,000</b>

Table 2-85: Estimated Exposure in Plain Dealing by Sector.  
(Source: Hazus)

Plain Dealing	Estimated Total Building Exposure by Sector
Agricultural	\$1,936,000
Commercial	\$29,419,000
Government	\$1,862,000
Industrial	\$2,438,000
Religious / Non-Profit	\$6,234,000
Residential	\$65,741,000
Schools	\$6,886,000
<b>Total</b>	<b>\$114,516,000</b>

#### Threat to People

The total population within the parish that is located within a wildland-urban interaction area is shown in the table below:

Table 2-86: Population Located within a Wildland-Urban Interaction Areas.  
(Source: 2010 U.S. Census Data)

Number of People Located in Wildland-Urban Interaction Areas			
Location	# in Community	# in Hazard Area	% in Hazard Area
Unincorporated Bossier Parish	58,565	40,715	69.7%
Benton	2,048	1,948	95.1%
Bossier City	62,701	28,245	45.0%
Haughton	4,539	3,454	76.1%
Plain Dealing	893	893	100.0%
<b>Total</b>	<b>128,746</b>	<b>75,377</b>	<b>58.5%</b>

The 2010 U.S. Census data was also extrapolated to provide an overview of populations located within wildland-urban interaction areas throughout the jurisdictions. The data is illustrated in the following tables:

*Table 2-87: Population in Unincorporated Bossier Parish Located within a Wildland-Urban Interaction Area.*

*(Source: 2010 Census Data)*

<b>Unincorporated Bossier Parish</b>		
<b>Category</b>	<b>Total Numbers</b>	<b>Percentage of People in Hazard Area</b>
<b>Number in Hazard Area</b>	40,837	69.7%
<b>Persons Under 5 Years</b>	2,818	6.9%
<b>Persons Under 18 Years</b>	10,128	24.8%
<b>Persons 65 Years and Over</b>	5,758	14.1%
<b>White</b>	25,709	63.0%
<b>Minority</b>	15,128	37.0%

*Table 2-88: Population in Benton Located within a Wildland-Urban Interaction Area.*

*(Source: 2010 Census Data)*

<b>Benton</b>		
<b>Category</b>	<b>Total Numbers</b>	<b>Percentage of People in Hazard Area</b>
<b>Number in Hazard Area</b>	1,948	95.1%
<b>Persons Under 5 Years</b>	183	9.4%
<b>Persons Under 18 Years</b>	401	20.6%
<b>Persons 65 Years and Over</b>	267	13.7%
<b>White</b>	1,062	54.5%
<b>Minority</b>	886	45.5%

*Table 2-89: Population in Bossier City Located within a Wildland-Urban Interaction Area.*

*(Source: 2010 Census Data)*

<b>Bossier City</b>		
<b>Category</b>	<b>Total Numbers</b>	<b>Percentage of People in Hazard Area</b>
<b>Number in Hazard Area</b>	28,245	45.0%
<b>Persons Under 5 Years</b>	2,034	7.2%
<b>Persons Under 18 Years</b>	6,666	23.6%
<b>Persons 65 Years and Over</b>	4,180	14.8%
<b>White</b>	14,885	52.7%
<b>Minority</b>	13,360	47.3%

*Table 2-90: Population in Haughton Located within a Wildland-Urban Interaction Area.  
(Source: 2010 Census Data)*

Haughton		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	3,454	76.1%
Persons Under 5 Years	228	6.6%
Persons Under 18 Years	939	27.2%
Persons 65 Years and Over	256	7.4%
White	2,449	70.9%
Minority	1,005	29.1%

*Table 2-91: Population in Plain Dealing Located within a Wildland-Urban Interaction Area.  
(Source: 2010 Census Data)*

Plain Dealing		
Category	Total Numbers	Percentage of People in Hazard Area
Number in Hazard Area	893	100.0%
Persons Under 5 Years	28	3.1%
Persons Under 18 Years	112	12.5%
Persons 65 Years and Over	225	25.2%
White	447	50.1%
Minority	446	49.9%

#### *Impacts of Climate Change*

The increasing probability and intensity of drought caused by climate change across Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing indicates that the risk of wildfires will also increase. The presence of drought or prolonged dry spells will lead to an increase in dry grasses, brush, and forests that act as fuel for fires.

The National Risk Index (NRI) includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the parish and Census tract level. The following table provides an overview of each category at the parish level for wildfires.

*Table 2-92: National Risk Index (NRI) Summarization of Wildfire Occurrences for the Parish  
(Source: National Risk Index)*

Expected Annual Losses	Overall Risk Rating
Very Low	Very Low

Wildfires and their aftermath can have significant psychological impacts on individuals and communities. Evacuations, loss of homes, and the destruction of familiar landscapes can lead to feelings of loss, anxiety, and trauma. Vulnerable populations, including those with pre-existing mental health conditions or limited access to support services, may be particularly affected. Additionally, the prolonged exposure to smoke, evacuation stress, and uncertainty about the future can contribute to mental health challenges.

Wildfires and their aftermath can have significant psychological impacts on individuals and communities. Evacuations, loss of homes, and the destruction of familiar landscapes can lead to feelings of loss, anxiety, and trauma. Vulnerable populations, including those with pre-existing mental health conditions or limited access to support services, may be particularly affected. Additionally, the prolonged exposure to smoke, evacuation stress, and uncertainty about the future can contribute to mental health challenges.

To address the impacts of wildfires on vulnerable populations, it is important to:

- Improve wildfire prevention and mitigation measures, including land management practices, controlled burns, and the removal of hazardous vegetation near communities.
- Enhance early warning systems and evacuation plans to ensure the timely and safe evacuation of vulnerable populations.
- Strengthen building codes and land-use planning to promote fire-resistant construction and discourage development in high-risk areas.
- Increase access to resources and support for vulnerable populations during and after wildfires, including emergency shelters, healthcare services, and mental health support.
- Promote community resilience through education and outreach programs, empowering individuals to take proactive measures to protect themselves and their communities from wildfires.
- Address underlying socioeconomic disparities and ensure that vulnerable populations have the necessary resources and support to recover and rebuild after a wildfire event.

#### *Vulnerability*

See [Appendix C](#) for parish and municipality facilities that could potentially be exposed to a wildfire hazard. Buildings were determined based on whether or not they fall within the wildfire-urban interface and/or intermix.

## Winter Weather

For Louisiana and other parts of the southeastern United States, a severe winter storm occurs when humid air from the Gulf of Mexico meets a cold air mass from the north. Once the cold air mass crosses Louisiana, and the temperature drops, precipitation may fall in the form of snow or sleet. If the ground temperature is cold enough but air temperature is above freezing, rain can freeze instantly on contact with the surface, causing massive ice storms.

The winter storm events that affect the state of Louisiana are ice storms, freezes, and snow events. Of the winter storm types listed above, ice storms are the most dangerous. Ice storms occur during a precipitation event when warm air aloft exceeds 32 °F, while the surface remains below the freezing point. Ice will form on all surfaces when precipitation originating as rain or drizzle contacts physical structures. These ice storms are usually accompanied by freezing temperatures and occasionally snow.

Winter storms can be accompanied by strong winds, creating blizzard conditions with blinding, wind driven snow, severe drifting, and dangerous wind chill. These types of conditions are very rare in Louisiana, even in north Louisiana, but ice storms are more common. The climatic line between snow and rain often stalls over north Louisiana, creating ideal conditions for ice accumulation.

In a typical winter storm event, homes and buildings are damaged by ice accumulation, either directly by the weight of the ice on the roofs or by trees and/or limbs falling on buildings. While it is not very prevalent, this type of damage can occur in Louisiana, particularly in north Louisiana. Effects of winter weather more likely to occur in Louisiana, especially southern Louisiana, include extreme temperatures which can cause waterlines to freeze and sewer lines to rupture. This is especially true with elevated or mobile homes since cold air is able to access more of the building's infrastructure. Winter storms can also have a devastating effect on agriculture, particularly on crops (like citrus) that are dependent on warm weather. Long exposures to low temperatures can kill many kinds of crops, and ice storms can weigh down branches and fruit.

Winter storms are not only a direct threat to human health through conditions like frostbite and hypothermia, but they are also an indirect threat to human health due to vehicle accidents and loss of power and heat, which can be disrupted for days. However, these impacts are rarely seen in Louisiana. As people use space heaters and fireplaces to stay warm, the risk of household fires and carbon monoxide poisoning increases.

Winter storm events occur throughout Louisiana usually during the colder calendar months of December, January, and February. Severe weather events do not occur with the same frequency across all parts of Louisiana. The northern quarter of Louisiana has historically experienced the most severe winter events between 1987 and 2012. The central, and to an even greater extent the southern parts of the state, such as Ascension Parish, have experienced the fewest severe winter events. The table on the next page shows the Sperry-Piltz Ice Accumulation Index which is utilized to predict the potential damage to overhead utility systems from freezing rain and ice storms.

Table 2-93: Sperry-Piltz Ice Accumulation Index

Ice Damage Index	Damage and Impact Descriptions
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged and widespread utility interruptions with extensive damage to main distribution feeder lines and some high voltage transmission lines/structure. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

#### Location

Because a winter storm is a climatological based hazard and has the same probability of occurring in Bossier Parish as all of the adjacent parishes, the entire planning area for Bossier Parish is equally at risk for winter storms. The worse-case scenario for Bossier Parish and all of its jurisdictions is a level 2 on the Sperry-Piltz Ice Accumulation Index.

#### Previous Occurrences / Extents

The NCEI Storm Events Database reports 16 winter weather events occurring within the boundaries of Bossier Parish between the years 1990 and 2021. Below is a brief synopsis of the winter weather events which occurred since the last Bossier Parish HMP Update in 2017.

Table 2-94: Previous Occurrences for Winter Storm Events

Date	Synopsis	Property Damage	Crop Damage
January 16, 2018	A trough of low pressure caused snow fall throughout the parish. In Bossier Parish, 2 miles northeast of Haughton recorded 3.0 inches, 2 miles north of Bossier City 3.0 inches, 1 mile northeast of Haughton 3.0 inches, Haughton 2.8 inches, Bossier City 2.3 inches, 5 miles east of Benton 2.0 inches, 2 miles west of Red Chute 2.0 inches, 5 miles south southeast of Benton 2.0 inches, 1 mile northwest of Barksdale Air Force Base 2.0 inches, 4 miles east southeast of Plain Dealing 1.6 inches, and 9 miles south southeast of Barksdale Air Force Base 1.5 inches.	\$0	\$0
February 8, 2019	An arctic cold front progressed southeast across the Ark-La-Tex during the daytime hours on February 7th, with temperatures falling from the 70s on the 7th, into the 20s and lower 30s by the morning of February 8th. Extensive mid and high clouds moved back into the region during the daytime hours on the 8 <sup>th</sup> .	\$0	\$0

Date	Synopsis	Property Damage	Crop Damage
January 10, 2021	Bossier Parish: Red Chute: 3.5 inches, Haughton: 3.0 inches, 4 S Bossier City: 3.0 inches, 5 NE Benton: 2.8 inches, Bossier City: 2.8 inches, 5 N Bossier City: 2.8 inches, Red River Research Station: 2.8 inches, 6.7 NNW Bossier City: 2.0 inches, Taylortown: 2.0 inches, 4 W Plain Dealing: 1.2 inches.	\$0	\$0
February 14, 2021	Bossier Parish: 7 NNW Bossier City: 6.0 inches, 3 ESE Plain Dealing: 5.8 inches, 5 N Plain Dealing: 5.0 inches, Red River Research Station: 3.2 inches, 4 S Bossier City: 2.5 inches.	\$0	\$0
February 16, 2021	Bossier Parish: 4 W Plain Dealing: 5.3 inches, Red River Research Station (South Bossier City): 4.1 inches, 5 NW Bossier City: 3.0 inches, Benton: 2.5 inches, 4 S Bossier City: 1.0 inches.	\$0	\$0

#### *Frequency / Probability*

Based on historical records, there have been 16 significant winter weather events within the boundaries of Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing; therefore, the annual chance of occurrence for winter weather is estimated at 52%.

#### *Estimated Potential Losses*

Since 1990, there have been 16 winter weather events that have resulted in property damages according to NCEI Storm Events Database. The total property damages associated with those storms have totaled approximately \$3,000. To estimate the potential losses of a winter weather event on an annual basis, the total damages recorded for winter weather was divided by the total number of years of available winter weather in the NCEI Storm Events Database (1990 - 2021). This provides an annual estimated potential loss of \$97 and \$188 per event. The following table provides an estimate of potential property losses for Bossier Parish:

*Table 2-95: Estimated Annual Losses Bossier Parish and its Jurisdictions Resulting from Winter Weather.*

Estimated Annual Losses for Winter Weather				
Unincorporated Area	Benton	Bossier City	Haughton	Plain Dealing
\$44	\$2	\$47	\$3	\$1

There have been no reported injuries or fatalities as a result of winter weather over the 31-year record.

#### *Impacts of Climate Change*

Winter weather is likely to become less frequent as the winter season decreases in length over the next century due to an increase in ambient and sea surface temperatures. By the end of the century, Bossier Parish and the jurisdictions of Benton, Bossier City, Haughton, and Plain Dealing are expected to experience a 5°F to 10°F increase in average ambient temperatures which will drastically reduce the number of days below freezing and lower the chance of winter weather. Precipitation is expected to increase during the winter months.

The National Risk Index (NRI) includes data on the expected annual losses to individual natural hazards, historical losses, and overall risk at the parish and Census tract level. The following table provides an overview of each category at the parish level for winter weather.

*Table 2-96: National Risk Index (NRI) Summarization of Winter Weather Occurrences for the Parish  
(Source: National Risk Index)*

Expected Annual Losses	Overall Risk Rating
Relatively Low	Relatively Low

Winter weather impacts can have significant health implications for vulnerable populations. Cold temperatures, coupled with inadequate heating or insulation in homes, can increase the risk of hypothermia and other cold-related illnesses. Additionally, extreme winter weather events can impede access to healthcare services, disrupt supply chains for essential medications, and create challenges for emergency response systems, putting vulnerable populations at higher risk.

Changes in winter weather patterns can have socioeconomic implications for vulnerable populations. For example, communities that rely on winter tourism, such as ski resorts or winter recreational activities, may experience reduced economic opportunities due to shorter snow seasons or less predictable weather conditions. Additionally, vulnerable populations engaged in winter-dependent industries, such as agriculture or seasonal employment, may face livelihood challenges due to altered growing seasons or disruptions in work availability.

Addressing the impacts of climate change on winter weather and vulnerable populations requires comprehensive approaches, including:

- Enhancing climate monitoring and prediction systems to better understand and anticipate changes in winter weather patterns.
- Developing and implementing climate adaptation strategies that consider the specific vulnerabilities and needs of vulnerable populations during winter events.
- Improving energy efficiency and access to affordable heating systems to reduce the health risks associated with cold temperatures.
- Strengthening infrastructure resilience to withstand extreme winter weather events, such as upgrading power grids and transportation systems.
- Enhancing public awareness and education on winter weather safety, including cold-related health risks and emergency preparedness.
- Promoting social support networks, including community outreach programs, to ensure vulnerable populations have access to resources, shelters, and healthcare during extreme winter events.
- Implementing sustainable land and water management practices to mitigate the impacts of altered snowfall patterns and earlier snowmelt on ecosystems and water resources.

#### *Vulnerability*

See Appendix C for parish and municipality building exposure to winter weather.

### 3. Capability Assessment

This section summarizes the results of efforts by each jurisdiction and other agency to develop policies, programs, and activities that directly or indirectly support hazard mitigation. It also provides information on resources and gaps in the parish's infrastructure, as well as relevant changes in its law since the last plan update, in order to suggest a mitigation strategy.

Through this assessment, Bossier Parish and the incorporated jurisdictions are able to identify strengths that could be used to reduce losses and reduce risk throughout the communities. It also identifies areas where mitigation actions might be used to supplement current capabilities and create a more resilient community before, during, and after a hazard event.

#### Policies, Plans and Programs

These capabilities are unique to the parish and jurisdictions, including planning, regulatory, administrative, technical, financial, and education and outreach resources. There are a number of mitigation-specific acts, plans, executive orders, and policies that lay out specific goals, objectives, and policy statements which already support or could support pre- and post-disaster hazard mitigation. Many of the ongoing plans and policies hold significant promise for hazard mitigation, and take an integrated and strategic look holistically at hazard mitigation in the Bossier Parish planning area to propose ways to continually improve it. These tools are valuable instruments in pre- and post-disaster mitigation as they facilitate the implementation of mitigation activities through the current legal and regulatory framework. Examples of existing documents include the following:

*Table 3-1: Planning and Regulatory Capabilities*

Capability Assessment Worksheet						
Local mitigation capabilities are existing authorities, policies and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.						
Planning and Regulatory						
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.						
Plans	Jurisdiction					Comments
	Bossier Parish	Benton	Bossier City	Houghton	Plain Dealing	
	Yes / No					
Comprehensive / Master Plan	Yes	Yes	Yes	No	No	
Capital Improvements Plan	Yes	No	Yes	No	Yes	
Economic Development Plan	Yes	Yes	No	No	No	
Local Emergency Operations Plan	Yes	Yes	Yes	Yes	No	
Continuity of Operations Plan	No	Yes	No	No	Yes	
Transportation Plan	Yes	No	Yes	No	No	
Stormwater Management Plan	Yes	No	Yes	Yes	No	
Community Wildfire Protection Plan	No	No	No	No	No	
Other plans (redevelopment, recovery, coastal zone management)	No	No	No	No	No	
Building Code, Permitting and Inspections						
	Yes / No					
Building Code	Yes	Yes	Yes	Yes	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	Yes	Fourth Class		Unknown	
Fire Department ISO/PIAL rating	No	Yes	1	2	4	
Site plan review requirements	Yes	Yes	Yes	Yes	Yes	
Land Use Planning and Ordinances						
	Yes / No					
Zoning Ordinance	Yes	Yes	Yes	Yes	No	
Subdivision Ordinance	Yes	Yes	Yes	Yes	No	
Floodplain Ordinance	Yes	Yes	Yes	Yes	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	No	Yes	Yes	No	
Flood Insurance Rate Maps	Yes	Yes	Yes	Yes	Yes	
Acquisition of land for open space and public recreation	Yes	No	Yes	Yes	No	
Other	No	no	No	No		

All jurisdictions within the Bossier Parish planning area will work to expand their capabilities by adding to these plans, as well as work to create new plans that will address a long-term recovery and resiliency framework. In instances where there are no existing plans, there will be a concerted effort to explore opportunities to create new plans that will address long-term recovery and resiliency framework as parish and local resources allow.

### Building Codes, Permitting, Land Use Planning and Ordinances

Bossier Parish Government provides oversight for building permits and codes, land use planning, and all parish ordinances.

As of the 2023 update, Bossier Parish and the incorporated communities ensure that all adopted building codes are enforced and in compliance relating to the construction of any structure within the boundaries of the parish. Building permits are required prior to beginning any type of construction or renovation projects, installation of electrical wiring, plumbing or gas piping, moving manufactured/modular or portable buildings, and reroofing or demolitions.

The Bossier Parish Police Jury is also responsible for enforcing the parish ordinances related to health and safety, property maintenance standards, and condemnation of unsafe structures.

The Bossier Parish Police Jury meets regularly to consider any proposed ordinance changes, and to take final actions on proposed changes.

While local capabilities for mitigation can vary from community to community, the jurisdictions within the Bossier Parish planning area as a whole have a system in place to coordinate and share these capabilities through the OHSEP and through this Parish Hazard Mitigation Plan.

Some programs and policies, such as the above described, might use complementary tools to achieve a common end, but fail to coordinate with or support each other. Thus, coordination among local mitigation policies and programs is essential to hazard mitigation.

### Administration, Technical, and Financial

The jurisdictions within the Bossier Parish planning area have administrative and technical capabilities in place that may be utilized in reducing hazard impacts or implementing hazard mitigation activities. Such capabilities include staff, skillset, and tools available in the community that may be accessed to implement mitigation activities and to effectively coordinate resources. The ability to access and coordinate these resources is also important. The table on the following page shows examples of resources in place.

Table 3-2: Administration and Technical Capabilities

Administration and Technical						
Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.						
	Bossier Parish	Benton	Bossier City	Haughton	Plain Dealing	Comments
<b>Administration</b>	Yes / No					
Planning Commission	Yes	Yes	Yes	Yes	No	
Mitigation Planning Committee	No	No	No	Yes	No	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	Yes	Yes	Yes	Yes	
<b>Staff</b>	Yes / No					
Chief Building Official	No	Yes	Yes	No	Yes	
Floodplain Administrator	Yes	Yes	Yes	Yes	Yes	
Emergency Manager	Yes	Yes	Yes	No	No	
Community Planner	Yes	No	Yes	No	No	
Civil Engineer	Yes	Yes	Yes	No	No	
GIS Coordinator	Yes	No	Yes	Yes	No	
Grant Writer	No	Yes	Yes	Yes	No	
Other	No	no	No	No		
<b>Technical</b>	Yes / No					
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	Yes	Yes	Yes	No	
Hazard Data & Information	Yes	No	Yes	Yes	No	
Grant Writing	No	Yes	Yes	No	No	
Hazus Analysis	No	No	Yes	No	No	
Other	No	No	No	No	No	

Financial capabilities are the resources that Bossier Parish and its incorporated jurisdictions have access to or are eligible to use in order to fund mitigation actions. Costs associated with implementing the actions identified by the parish may vary from little to no cost actions, such as outreach efforts, or substantial action costs such acquisition of flood prone properties.

The following financial resources are available to fund mitigation actions in the Bossier Parish planning area:

Table 3-3: Financial Capabilities

Financial						
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.						
	Bossier Parish	Benton	Bossier City	Haughton	Plain Dealing	Comments
<b>Funding Resource</b>	Yes / No					
Capital Improvements project funding	Yes	Yes	Yes	Yes	No	
Authority to levy taxes for specific purposes	Yes	Yes	No	Yes	No	
Fees for water, sewer, gas, or electric services	Yes	Yes	Yes	Yes	Yes	
Impact fees for new development	Yes	Yes	Yes	Yes	No	
Stormwater Utility Fee	No	No	No	No	No	
Community Development Block Grant (CDBG)	Yes	Yes	Yes	Yes	No	
Other Funding Programs	No	Yes	Yes	No	No	

### Education and Outreach

A key element in hazard mitigation is promoting a safer, more disaster resilient community through education and outreach activities and/or programs. Successful outreach programs provide data and information that improves overall quality and accuracy of important information for citizens to feel better prepared and educated with mitigation activities. These programs enable the individual communities and the parish as a whole to maximize opportunities for implementation of activities through greater acceptance and consensus of the community.

The jurisdictions within the Bossier Parish planning area have existing education and outreach programs to implement mitigation activities, as well as communicate risk and hazard related information to its communities. Specifically, focusing on advising repetitive loss property owners of ways they can reduce their exposure to damage by repetitive flooding remains a priority for the entire parish. The existing programs are as follows:

*Table 3-4: Education and Outreach Capabilities*

Education and Outreach						
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.						
Program / Organization	Yes / No					Comments
	Bossier Parish	Benton	Bossier City	Houghton	Plain Dealing	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	No	No	Yes	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	No	No	Yes	No	
Natural Disaster or safety related school program	Yes	No		Yes	Yes	
Storm Ready certification	Yes	No	No	No	No	
Firewise Communities certification	No	No	No	No	No	
Public/Private partnership initiatives addressing disaster related issues	Yes	No	No	Yes	No	
Other	Yes	No	No	No	No	

As reflected with the above existing regulatory mechanisms, programs and resources within the parish, the jurisdictions within the Bossier Parish planning area remain committed to expanding and improving on the existing capabilities within the parish. Communities will work together along with Bossier Parish toward increased participation in funding opportunities and available mitigation programs. Should funding become available, the hiring of additional personnel to dedicate to hazard mitigation initiatives and programs, as well as increasing ordinances within the parish, will enhance and expand overall risk reduction for the entirety of Bossier Parish.

### Flood Insurance and Community Rating System

Participation in the CRS strengthens local capabilities by lowering flood insurance premiums for jurisdictions that exceed NFIP minimum requirements. As noted in the CRS Eligible Communities List effective October 1, 2023, the City of Bossier City is rated as a Class 9 community.

The Federal Emergency Management Agency's National Flood Insurance Program (NFIP) administers the Community Rating System (CRS). Under the CRS, flood insurance premiums for properties in participating communities are reduced to reflect the flood protection activities that are being implemented. This program can have a major influence on the design and implementation of flood mitigation activities, so a brief summary is provided here.

A community receives a CRS classification based upon the credit points it receives for its activities. It can undertake any mix of activities that reduce flood losses through better mapping, regulations, public information, flood damage reduction and/or flood warning and preparedness programs.

There are ten CRS classes: Class 1 requires the most credit points and gives the largest premium reduction; Class 10 receives no premium reduction (see [Figure 3-1](#)). A community that does not apply for the CRS or that does not obtain the minimum number of credit points is a class 10 community.

CLASS	DISCOUNT	CLASS	DISCOUNT
1	45%	6	20%
2	40%	7	15%
3	35%	8	10%
4	30%	9	5%
5	25%	10	–

SFHA (Zones A, AE, A1-A30, V, V1-V30, AO, and AH): Discount varies depending on class.  
 SFHA (Zones A99, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO): 10% discount for Classes 1-6; 5% discount for Classes 7-9.\*  
 Non-SFHA (Zones B, C, X, D): 10% discount for Classes 1-6; 5% discount for Classes 7-9.

*Figure 3-1: CRS Discounts by Class*  
 (Source: FEMA)

As of October 2023, 318 communities in the State of Louisiana participate in the Federal Emergency Management Agency's National Flood Insurance Program (NFIP). Of these communities, 47 (or 13%) participate in the Community Rating System (CRS). Jefferson Parish leads the state with a rating of Class 5, followed by four cities with a rating of Class 6: the Cities of Gretna and Kenner in Jefferson Parish and the Cities of Mandeville and Slidell

in St. Tammany Parish. Of the top fifty Louisiana communities, in terms of total flood insurance policies held by residents, 29 participate in the CRS. The remaining 21 communities present an outreach opportunity for encouraging participation in the CRS.

The CRS provides an incentive not just to start new mitigation programs, but to keep them going. There are two requirements that "encourage" a community to implement flood mitigation activities. Once the parish has obtained a CRS rating and is a participant, the parish will receive CRS credit for this plan when it is adopted. To retain that credit, though, the parish must submit an evaluation report on progress toward implementing this plan to FEMA by October 1 of each year. That report must be made available to the media and the public. Second, the parish must annually recertify to FEMA that it is continuing to implement its CRS credited activities. Failure to maintain the same level of involvement in flood protection can result in a loss of CRS credit points and a resulting increase in flood insurance rates to residents.

In 2011<sup>1</sup>, the National Flood Insurance Program (NFIP) completed a comprehensive review of the Community Rating System (CRS) that resulted in the release of a new CRS Coordinator's Manual. The changes to the 2013 CRS Coordinator's Manual are the result of a multi-year program evaluation that included input from a broad group of contributors to evaluate the CRS and refine the program to meet its stated goals. The changes helped to drive new achievements in the following six core flood loss reduction areas important to the NFIP: (1) reduce liabilities to the NFIP Fund; (2) improve disaster resiliency and sustainability of communities; (3) integrate a Whole Community approach to addressing emergency management; (4) promote natural and beneficial functions of floodplains; (5) increase understanding of risk, and; (6) strengthen adoption and enforcement of disaster-resistant building codes.

Since the revision of the 2013 Coordinator's Manual, FEMA released the 2017 CRS Coordinator's Manual which continued the evolution of the CRS program and its mission to reward communities that prioritize mindful floodplain regulations. As with the 2013 manual, the changes made in the 2017 manual impact each CRS community differently. Some communities see an increase in the points they receive since points for certain activities have increased (e.g., Activity 420 Open Space Preservation). Other communities receive fewer points for certain activities (e.g., Activity 320 Map Information Service). It is likely that some communities with marginal CRS Class 9 programs have to identify new CRS credits in order to remain in the CRS class. Most notably, as it relates to this hazard mitigation plan, more credit was made available for Activity 410 Floodplain Mapping.

<sup>1</sup> <https://www.fema.gov/national-flood-insurance-program-community-rating-system>

Typically, CRS communities do not request credit for all the activities they are currently implementing unless it would earn enough credit to advance the community to a higher CRS Class. A community that finds itself losing CRS credit with the 2017 manual could likely identify activities deserving credit they had not previously received. Due to the changes in both activities and CRS points, community CRS coordinators should speak with their ISO/CRS Specialist to understand how the 2017 manual will impact their community and when.

In addition to the direct financial reward for participating in the Community Rating System, there are many other reasons to participate in the CRS. As FEMA staff often say, "If you are only interested in saving premium dollars, you're in the CRS for the wrong reason."

The other benefits that are more difficult to measure in dollars include:

1. The activities credited by the CRS provide direct benefits to residents, including:

- Enhanced public safety
- A reduction in damage to property and public infrastructure
- Avoidance of economic disruption and losses
- Reduction of human suffering
- Protection of the environment

2. A community's flood programs will be better organized and more formal. Ad hoc activities, such as responding to drainage complaints rather than an inspection program, will be conducted on a sounder, more equitable basis.

3. A community can evaluate the effectiveness of its flood program against a nationally recognized benchmark.

4. Technical assistance in designing and implementing a number of activities is available at no charge from the Insurance Services Office.

5. The public information activities will build a knowledgeable constituency interested in supporting and improving flood protection measures.

6. A community would have an added incentive to maintain its flood programs over the years. The fact that its CRS status could be affected by the elimination of a flood related activity or a weakening of the regulatory requirements for new developments would be taken into account by the governing board when considering such actions.

7. Every time residents pay their insurance premiums, they are reminded that the community is working to protect them from flood losses, even during dry years.

### NFIP Worksheets

Parish NFIP worksheets can be found in *Appendix E: State Required Worksheets*.

## 4. Mitigation Strategy

### Introduction

The Hazard Mitigation Strategy for Bossier Parish and its incorporated communities have a common guiding principle and is the demonstration of the parish's commitment to reduce risks from hazards. The strategy also serves as a guide for parish and local decision makers as they commit resources to reducing the effects of hazards.

Officials from all jurisdictions within the planning area confirmed the goals, objectives, actions and projects over the period of the hazard mitigation plan update process. The mitigation actions and projects in this 2023 HMP update are a product of analysis and review of the Bossier Parish Hazard Mitigation Plan Planning Committee under the coordination of the Bossier Parish Office of Homeland Security and Emergency Preparedness. The committee was presented a list of projects and actions, new and from the 2017 plan, for review from January 2023 – July 2023

An online public opinion survey of Bossier Parish residents was conducted between October 2022 – July 2023. The survey was designed to capture public perceptions and opinions regarding natural hazards in the Bossier Parish planning area. In addition, the survey collected information regarding the methods and techniques preferred by the respondents for reducing the risks and losses associated with local hazards.

This activity was created in an effort to confirm that the goals and action items developed by the Bossier Parish Hazard Mitigation Plan Planning Committee are representative of the outlook of the community at large. However, because there were no responses to the survey, this public feedback could not be incorporated into the plan. The full Bossier Parish survey can be found at the following link:

<https://www.surveymonkey.com/r/BossierHM2022>

### Goals

The goals represent the guidelines that the parish and its communities want to achieve with this plan update. To help implement the strategy and adhere to the mission of the Hazard Mitigation Plan, the preceding section of the plan update was focused on identifying and quantifying the risks faced by the residents and property owners in Bossier Parish from natural and manmade hazards. By articulating goals and objectives based on the previous plans, the risk assessment results, and intending to address those results, this section sets the stage for identifying, evaluating, and prioritizing feasible, cost effective, and environmentally sound actions to be promoted at the parish and municipal level – and to be undertaken by the state for its own property and assets. By doing so, Bossier Parish can make progress toward reducing identified risks.

For the purposes of this plan update, goals and action items are defined as follows:

- **Goals** are general guidelines that explain what the parish wants to achieve. Goals are expressed as broad policy statements representing desired long-term results.
- **Action Items** are the specific steps (projects, policies, and programs) that advance a given goal. They are highly focused, specific, and measurable.

The current goals of the Bossier Parish Hazard Mitigation Plan Update Planning Committee represent long-term commitments by the parish. After assessing these goals, the committee decided that the current remain valid.

The goals are as follows:

1. Enhance and develop emergency services, including response
2. Protect lives and property from the dangers of natural hazards

The Mitigation Action Plan focuses on actions to be taken by Bossier Parish and its communities. All of the activities in the Mitigation Action Plan will be focused on helping the parish and its communities in developing and funding projects that are not only cost effective but also meet the other DMA 2000 criteria of environmental compatibility and technical feasibility.

Prior to the adoption of the 2017 Bossier Parish Hazard Mitigation Plan, large portions of Louisiana were impacted by two flooding events whose ramifications are still being felt by the population. Because of this event, Bossier Parish and its jurisdictions reprioritized its efforts and became much more aggressive in seeking funding for flood mitigation efforts, particularly related to drainage. Pressure was placed on political leaders throughout the parish and jurisdictions to ensure that money and resources were sought and made available to mitigate against such events in the future.

The Hazard Mitigation Plan Planning Committee reviewed and evaluated the potential action and project lists in which consideration was given to a variety of factors. Such factors include determining a project's eligibility for federal mitigation grants as well as its ability to be funded. This process required evaluation of each project's engineering feasibility, cost effectiveness, and environmental and cultural factors.

### 2023 Mitigation Actions and Update on Previous Plan Actions

The Bossier Parish Hazard Mitigation Plan Planning Committee identified new actions that would reduce and/or prevent future damage within the Bossier Parish planning area. In that effort, the committee focused on a comprehensive range of specific mitigation actions. These actions were identified in thorough fashion by the consultant team and the committee by way of frequent and open communications and meetings held throughout the planning process. The addition of these new actions, coupled with any ongoing and/or carried over projects from their previous update, provide Bossier Parish with a solid mitigation strategy through which risk and losses will be reduced throughout the parish and its communities.

As outlined in the Local Mitigation Planning Handbook the following are eligible types of mitigation actions:

- **Local Plans and Regulations** – These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- **Structure and Infrastructure Projects** – These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area, and also includes projects to construct manmade structures to reduce the impact of hazards.
- **Natural System Protection** – These actions minimize the damage and losses and also preserve or restore the functions of natural systems.
- **Education and Awareness Programs** – These actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.

Status updates for actions included in the previous plan can be found on the following pages. Additionally, new mitigation actions agreed upon by the parish and its jurisdictions are included.

## Bossier Parish Mitigation Actions

*Previous Action Update***Unincorporated Bossier Parish Mitigation Action Update**

Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
BOS1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Bossier Parish Mitigation Action 1)
BOS2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Tropical Cyclones	Not Started - Carried Over (See Bossier Parish Mitigation Action 2)
BOS3: Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Flooding, Levee Failure, Tropical Cyclones,	In Progress
BOS4: Safe Room Projects	Construction of a safe room for first responders located in Bossier Parish. Other locations will be identified based on funding availability.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	In Progress

BOS5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, and Winter Weather hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Ongoing
BOS6: Generators for Continuity of Operations and Government	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	Not Started - Carried Over (See Bossier Parish Mitigation Action 3)
BOS7: Lightning Mitigation	Procurement and Installation of lightning rods and surge protectors for public buildings to preserve life and property	HGMP, BRIC, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Thunderstorms	Not Started - Carried Over (See Bossier Parish Mitigation Action 4)
BOS8: Warning Systems	Update/upgrade public warning system components throughout Bossier Parish as necessary. Install audible and/or reverse 911 warning system(s).	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Levee Failure, Tornadoes, Tropical Cyclone, Wildfires, Winter Weather	Completed
BOS9: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Dam Failure, Levee Failure, Tropical Cyclones	Ongoing
BOS10: Dam and Levee Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam and/or levee failure.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Dam Failure, Levee Failure, Tropical Cyclones	Not Started - Carried Over (See Bossier Parish Mitigation Action 5)
BOS11: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	HGMP, BRIC, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Drought	Not Started - Carried Over (See Bossier Parish Mitigation Action 6)

BOS12: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	HGMP, BRIC, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Wildfires	Completed
BOS13: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Ongoing
BOS14: Auxiliary Power Generators	Purchase and install auxiliary power generators at critical facilities in the Parish. Benefits: Maintains operability of water systems for pressure necessary to maintain fire protection and other critical facilities necessary for livability in the Parish during power failures caused by storm events.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	Deleted - Duplicate of BOS6
BOS15: Light Towers	Purchase and deploy light towers to enhance public safety at critical facilities. Benefits: Provides for the safety of the public at critical facilities during major power outages.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Bossier Parish Mitigation Action 7)
BOS16: Portable Stormwater Pump	Purchase and deploy a portable stormwater pump with generator as needed at critical flood-prone locations. Benefits: Can help to reduce threat of flooding, thereby limiting property damage during heavy rain events.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	Completed
BOS17: Retrofit Public Shelters	Retrofit public buildings currently used as shelters to provide with air-conditioning, kitchens, and bathroom / shower facilities; wind-protection measures (storm shutters, hurricane straps, etc.) where needed and inspect for structural soundness. Benefits: Greatly increases public safety at shelter facilities (that are so improved).	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	Deleted - Duplicate of BOS1

BOS18: Parish Critical Buildings Wind Retrofitting	Harden all Parish critical buildings against wind-related hazards by wind-retrofitting with wind-proof windows and/or shutters, doors, roof tie-down fittings, etc. Also include at appropriate critical buildings safe rooms to afford emergency protection to personnel operating these buildings and facilities. Benefits: Reduces or eliminates wind-related damages at such facilities, provides emergency protection to critical personnel operating such facilities during wind hazard events.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	Deleted - Duplicate of BOS1
BOS19: Remove Repetitive Loss Structures	Acquire and remove repetitive loss structures from flood-prone areas of the Parish. Benefits: Removes flood-prone properties from flood hazard areas, reducing costs to taxpayers to cover future flood damages, and ultimately helping to reduce the cost of flood insurance.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding	Deleted - Duplicate of BOS3
BOS20: Strengthen Flood Damage Prevention	Continue to use joint committee to strengthen flood damage prevention and floodplain management ordinances within the Parish and each jurisdiction in order to reduce or prevent storm-related damages to buildings and infrastructure. Benefits: Such ordinance improvements will help mitigate the risk of damage to buildings and infrastructure by increasing restrictions on (new) construction in flood-prone areas of the Parish.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding	Ongoing

BOS21: Enhance Building Inspection Capabilities	Continue to enhance building inspection capabilities of Parish's building inspection department to verify compliance with IBC, including fire resistant materials for (new) homes built in high fire risk areas of Parish. Benefits: Better training and other improvements to capabilities of this department will help to mitigate a variety of hazards throughout the Parish.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	In Progress
BOS22: Elevate Flood-Prone Properties	Initiate a program to elevate identified flood-prone properties where feasible including, but not limited to, properties in a dam inundation area, or employ a variety of flood-proofing techniques. Benefit: Reduces future vulnerability from flooding and helps to reduce losses and flood insurance premiums.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Dam Failure, Levee Failure	Deleted - Duplicate of BOS3
BOS23: Raise and Harden Levees	Raise and harden levees in the Parish to reduce the threat of levee failure and/or overtopping during flood events. Benefits: Will greatly reduce the threat of flooding in vulnerable adjacent communities.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Levee Failure	Not Started - Carried Over (See Bossier Parish Mitigation Action 8)
BOS24: Masters of Disasters Education Program	Implement the Red Cross "Masters of Disasters" education program in local school system to provide public awareness of local hazard (exposure). Benefits: Very cost-effective program has the possibility of reaching the greatest number of people (in the Parish).	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	Deleted - Duplicate of BOS5

BOS25: All Hazards Activities	Sponsor "All-Hazards Activities" in the Parish to educate citizens and/or homeowners on the causes and impacts of all natural hazards that threaten public safety and property in the Parish. Benefits: Attendees will have access to presentations, pamphlets, and flyers offering tips for hazard prevention, preparedness, and response, as well as contact information for additional guidance and information.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	Deleted - Duplicate of BOS5
BOS26: New Program Flyer	Develop, print, and distribute a new flyer explaining benefits of NFIP program to residents of Parish, its eligibility for CRS program, and benefits of this program to property owners. Benefits: Potential expansion of the NFIP programs in the Parish and, through participation in CRS program, the lowering of flood insurance premiums.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding	Deleted - Duplicate of BOS5
BOS27: Complete Drainage Projects	After completion of engineering studies by USACE, undertake and complete various drainage projects including, but not limited to, dam areas around the Parish. Benefits: When complete, proposed drainage projects will help to significantly limit property damage due to flooding, as well as (over time) reduce property costs and insurance premiums, and protect public health and safety.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding	Deleted - Duplicate of BOS2
BOS28: Mobile Generators	Maintain functionality of water treatment facilities by purchasing mobile generators. Benefits: Ensures functionality of water treatment and public sewer systems during power outages, limiting risk to public health and the environment.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Deleted - Duplicate of BOS6

BOS29: Sandbagging Equipment	Purchase sandbagging equipment so that sandbags can be quickly packed and delivered to at-risk locations in the Parish. Benefits: Faster response to expected river/stream level rise or to heavy rains can help to reduce property damage from flooding.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Dam Failure, Flooding, Levee Failure, Tropical Cyclones	Completed
BOS30: Diversion Channel Construction	Protect critical assets in at-risk areas by construction of diversion channel from Red Chute to Flat River. Benefits: Diversion channel will improve local economy, (reduce flooding risk and subsequent property damage) by lowering property insurance premiums in area of significant growth in Parish.	HGMP, BRIC, FMA, Local	1-5 years	Bossier Parish Police Jury/Bossier Parish OHSEP	Flooding	Completed

*New Mitigation Actions*

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
	DESCRIPTION
<b>BOSSIER PARISH MITGATION ACTION 1</b>	Building Retrofits
<b>LEAD AGENCY</b>	Bossier Parish OHSEP
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Retrofit public buildings exterior shell to maintain use during and after storm events
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Reduces damage from high wind related events, and helps assure that the public buildings can be used, occupied and operable during or after storms.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
	DESCRIPTION
<b>BOSSIER PARISH MITIGATION ACTION 2</b>	Drainage Improvements
<b>LEAD AGENCY</b>	Bossier Parish OHSEP
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
DESCRIPTION	
<b>BOSSIER PARISH MITIGATION ACTION 3</b>	Generators for Continuity of Operations and Government
<b>LEAD AGENCY</b>	Bossier Parish OHSEP
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Installation of generators will allow public facilities to run accordingly and aid with local relief efforts
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
	DESCRIPTION
<b>BOSSIER PARISH MITIGATION ACTION 4</b>	Lightning Mitigation
<b>LEAD AGENCY</b>	Bossier Parish OHSEP
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	The installation of lightning rods and surge protectors in public buildings and critical infrastructure will reduce losses due to lightning strikes and surges in electricity.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Thunderstorms

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
	DESCRIPTION
<b>BOSSIER PARISH MITIGATION ACTION 5</b>	Dam and Levee Failure Working Group
<b>LEAD AGENCY</b>	Bossier Parish Police Jury
<b>SUPPORTING AGENCIES</b>	US Army Corps of Engineers, Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Create a working group in order to assess the extent and determine the possible impact of a dam and levee failure
<b>Type of Mitigation Action</b>	Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Creation of working group will allow levees to be assessed and determine the specific areas of inundation related to dam and levee failure.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Dam Failure, Flooding

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
	DESCRIPTION
<b>BOSSIER PARISH MITIGATION ACTION 6</b>	Drought Ordinances
<b>LEAD AGENCY</b>	Bossier Parish OHSEP
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Adopt ordinances requiring water-saving measures in time of drought.
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Adopting water saving ordinances will allow for water to be regulated and distributed throughout the community when drought related events are imminent
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Drought

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
	DESCRIPTION
<b>BOSSIER PARISH MITIGATION ACTION 7</b>	Light Towers
<b>LEAD AGENCY</b>	Bossier Parish OHSEP
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HGMP, BRIC, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Purchase and deploy light towers to enhance public safety at critical facilities.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Provides for the safety of the public at critical facilities during major power outages.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Dam Failure, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
	DESCRIPTION
<b>BOSSIER PARISH MITIGATION ACTION 8</b>	Raise and Harden Levees
<b>LEAD AGENCY</b>	Bossier Parish OHSEP
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HGMP, BRIC, USACE
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Raise and harden levees in the Parish to reduce the threat of levee failure and/or overtopping during flood events.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects, Natural Systems Protection
<b>How Action Aligns with Risk Reduction</b>	Benefits: Will greatly reduce the threat of flooding in vulnerable adjacent communities.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Levee Failure

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
	DESCRIPTION
<b>BOSSIER PARISH MITIGATION ACTION 9</b>	Construction of Floodwalls for Inundation Zones
<b>LEAD AGENCY</b>	Bossier Parish OHSEP
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury, State of Louisiana
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, FMA, Local
<b>ASSOCIATED GOALS</b>	<ol style="list-style-type: none"> <li>1. Enhance and develop emergency services, including response.</li> <li>2. Protect lives and property from the dangers of natural hazards.</li> </ol>
<b>PRIORITY</b>	High
<b>Action Description</b>	Construct floodwalls for communities and/or the parish that are in inundation zones and can be impacted by the failure of a High Hazard Potential Dam (HHPD). The parish will work alongside with the Dam Failure Working Group and the State of Louisiana to determine where inundation zones are in the parish and where floodwalls will need to be placed.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Construction of floodwalls for communities will reduce the risk of flooding from a HHPD failure and reduce the risk of loss of life/property.
<b>Current Status of Action</b>	New
<b>Hazard Addressed</b>	Dam Failure, Flooding

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS BOSSIER PARISH	
	DESCRIPTION
<b>BOSSIER PARISH MITIGATION ACTION 10</b>	Auxiliary Spillway Addition for HHPD's in Bossier Parish
<b>LEAD AGENCY</b>	Bossier Parish OHSEP
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury, State of Louisiana
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, FMA, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Retrofit the HHPD's in Bossier Parish with an auxiliary spillway, stabilizing the dam with anchors to prevent sliding and allowing it to hold more water
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	The addition of an auxiliary spillway will allow HHPD's to hold more water and prevent overtopping causing the surrounding areas to flood.
<b>Current Status of Action</b>	New
<b>Hazard Addressed</b>	Dam Failure, Flooding

## Town of Benton Mitigation Actions

*Previous Action Update*

Town of Benton Mitigation Action Update						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
BEN1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish Police Jury	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Benton Mitigation Action 1)
BEN2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish Police Jury	Flooding, Tropical Cyclones	Ongoing
BEN3: Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish Police Jury	Flooding, Levee Failure, Tropical Cyclones,	Not Started - Carried Over (See Town of Benton Mitigation Action 2)
BEN4: Safe Room Projects	Construction of a safe room for first responders located in Benton. Other locations will be identified based on funding availability.	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ GOHSEP / Bossier Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Benton Mitigation Action 3)

BEN5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires and Winter Weather hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Ongoing
BEN6: Generators for continuity of operations and government	Procurement and installation of generators at public facilities to ensure continued operations during and after events.	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish Police Jury	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	In Progress
BEN7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property	HGMP, BRIC, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish Police Jury	Thunderstorms	Not Started - Carried Over (See Town of Benton Mitigation Action 4)
BEN8: Warning Systems	Update/upgrade public warning system components throughout Benton as necessary. Install audible and/or reverse 911 warning system(s)	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish OHSEP	Levee Failure, Tornadoes, Tropical Cyclone, Wildfires, Winter Weather	Ongoing
BEN9: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish Police Jury	Flooding, Levee Failure, Tropical Cyclones	Not Started - Carried Over (See Town of Benton Mitigation Action 5)
BEN10: Levee Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a levee failure.	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	Not Started - Carried Over (See Town of Benton Mitigation Action 6)

BEN11: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	HGMP, BRIC, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish Police Jury	Drought	Not Started - Carried Over (See Town of Benton Mitigation Action 7)
BEN12: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	HGMP, BRIC, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish Police Jury	Wildfires	Completed
BEN13: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/ installation of backflow preventers at appropriate critical locations.	HGMP, BRIC, FMA, Local	1-5 years	Town of Benton Mayor's Office/ Bossier Parish Police Jury	Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Ongoing

*New Mitigation Actions*

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF BENTON	
DESCRIPTION	
<b>TOWN OF BENTON MITIGATION ACTION 1</b>	Building Retrofits
<b>LEAD AGENCY</b>	Town of Benton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Retrofit public buildings exterior shell to maintain use during and after storm events
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Reduces damage from high wind related events, and helps assure that the public buildings can be used, occupied and operable during or after storms.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF BENTON	
	DESCRIPTION
<b>TOWN OF BENTON MITIGATION ACTION 2</b>	Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures
<b>LEAD AGENCY</b>	Town of Benton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury,
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Structure and Infrastructure Projects, Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Eliminates flooding risk of repetitive and severe repetitive loss structures.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Levee Failure, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF BENTON	
	DESCRIPTION
<b>TOWN OF BENTON MITIGATION ACTION 3</b>	Safe Room Projects
<b>LEAD AGENCY</b>	Town of Benton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP, GOHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Construction of a safe room for first responders located in Benton. Other locations will be identified based on funding availability.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Allows for continued operations of essential personal to actively respond during a natural hazard event
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF BENTON	
	DESCRIPTION
<b>TOWN OF BENTON MITIGATION ACTION 4</b>	Lightning Mitigation
<b>LEAD AGENCY</b>	Town of Benton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	The installation of lightning rods and surge protectors in public buildings and critical infrastructure will reduce losses due to lightning strikes and surges in electricity.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Thunderstorms

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF BENTON	
	DESCRIPTION
<b>TOWN OF BENTON MITIGATION ACTION 5</b>	Promote Flood Insurance
<b>LEAD AGENCY</b>	Town of Benton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).
<b>Type of Mitigation Action</b>	Education and Awareness Programs
<b>How Action Aligns with Risk Reduction</b>	Educating the public on flood insurance will allow public to obtain insurance at a cost that's affordable to them and will help gain relief to their home and personal items during post-flood events
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Levee Failure, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF BENTON	
	DESCRIPTION
<b>TOWN OF BENTON MITIGATION ACTION 6</b>	Levee Failure Working Group
<b>LEAD AGENCY</b>	Town of Benton Mayor's Office
<b>SUPPORTING AGENCIES</b>	US Army Corps of Engineers, Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Create a working group in order to assess the extent and determine the possible impact of a levee failure.
<b>Type of Mitigation Action</b>	Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Creation of working group will allow levees to be assessed and determine the specific areas of inundation related to levee failure.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Levee Failure

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF BENTON	
	DESCRIPTION
<b>TOWN OF BENTON MITGATION ACTION 7</b>	Drought Ordinances
<b>LEAD AGENCY</b>	Town of Benton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Adopt ordinances requiring water-saving measures in time of drought.
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Adopting water saving ordinances will allow for water to be regulated and distributed throughout the community when drought related events are imminent
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Drought

## City of Bossier City Mitigation Actions

## Previous Action Update

City of Bossier City Mitigation Action Update						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
BC1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Ongoing (See Bossier City Mitigation Action 1)
<b>Comments on Status:</b> Municipal buildings are evaluated throughout the year for deficiencies. As improvements are made, safety is considered in the design and construction or repair. Following the winter storms of 2021, improvements were made to buildings that sustained damage due to their winter precipitation. The generator at the Public Utilities complex was upgraded in 2023 and the old generator was installed at the Animal Services building to ensure both buildings can operate in the event of a power outage.						
BC2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office/ Bossier Parish Police Jury	Flooding, Tropical Cyclones	Ongoing (See Bossier City Mitigation Action 2)
<b>Comments on Status:</b> Multiple projects have been completed to improve drainage throughout the City of Bossier City. Cleaning and repair of drainage ditches throughout the City is ongoing on a rotating basis. \$700,000 was allocated for drainage ditch maintenance for 2023. The City has also invested \$150,000 to develop a Stormwater Master Plan. Projects currently in progress are improvements to Mack's Bayou, Bardot drainage ditch, and Lateral B-1. The City has applied for state funding through the Watershed Initiative for further improvements in and around the Bardot drainage ditch. In 2019, the City approved \$1.3 million in funding to improve the pump station at the Hamilton Road underpass.						

BC3: Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office/ Bossier Parish Police Jury	Flooding, Levee Failure, Tropical Cyclones,	Ongoing (See Bossier City Mitigation Action 3)
<b>Comments on Status:</b> The City is continuing to address the repetitive loss lists through drainage improvements or acquisition/demolition of repetitive loss structures.						
BC4: Safe Room Projects	Construction of a safe room for first responders located in Bossier City. Other locations will be identified based on funding availability.	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office/ Bossier Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Ongoing (See Bossier City Mitigation Action 4)
<b>Comments on Status:</b> Fire station #6 was recently constructed with a safe room. Other municipal buildings, such as Municipal Complex, are targeted for construction of Safe Rooms as funds become available. Priority will be given to buildings based on occupancy and use for public purposes.						
BC5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires and Winter Weather hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office/ Bossier Parish OHSEP	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Ongoing (See Bossier City Mitigation Action 5)
<b>Comments on Status:</b> The City sends annual notices regarding flooding, drought, severe weather, etc as part of CRS requirements.						
BC6: Generators for Continuity of Operations and Government	Procurement and installation of generators at public facilities to ensure continued operations during and after events.	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	Completed
BC7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property	HGMP, BRIC, Local	1-5 years	City of Bossier City Mayor's Office/ Bossier Parish OHSEP	Thunderstorms	Completed

BC8: Warning Systems	Update/upgrade public warning system components throughout Bossier City as necessary. Install audible and/or reverse 911 warning system(s)	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office/ Bossier Parish OHSEP	Levee Failure, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started – Carried Over (See Bossier City Mitigation Action 6)
BC9: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office/ Bossier Parish OHSEP	Flooding, Levee Failure, Tropical Cyclones	Completed
BC10: Levee Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam and/or levee failure.	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office/ Bossier Parish OHSEP/ USACE	Flooding, Levee Failure, Tropical Cyclones	Not Started – Carried Over (See Bossier City Mitigation Action 7)
BC11: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	HGMP, BRIC, Local	1-5 years	City of Bossier City Council / Bossier Parish Police Jury	Drought	Not Started - Carried Over (See Bossier City Mitigation Action 8)
BC12: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	HGMP, BRIC, Local	1-5 years	City of Bossier City Council/ Bossier Parish Police Jury	Wildfires	Not Started - Carried Over (See Bossier City Mitigation Action 9)
BC13: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/ installation of backflow preventers at appropriate critical locations.	HGMP, BRIC, FMA, Local	1-5 years	City of Bossier City Mayor's Office/ Bossier Parish Police Jury	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Completed

*New Mitigation Actions*

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS CITY OF BOSSIER CITY	
DESCRIPTION	
<b>CITY OF BOSSIER CITY MITIGATION ACTION 1</b>	Building Retrofits
<b>LEAD AGENCY</b>	City of Bossier City Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Retrofit public buildings exterior shell to maintain use during and after storm events
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Reduces damage from high wind related events, and helps assure that the public buildings can be used, occupied and operable during or after storms.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS CITY OF BOSSIER CITY	
	DESCRIPTION
<b>CITY OF BOSSIER CITY MITIGATION ACTION 2</b>	Drainage Improvements
<b>LEAD AGENCY</b>	City of Bossier City Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS CITY OF BOSSIER CITY	
	DESCRIPTION
<b>CITY OF BOSSIER CITY MITIGATION ACTION 3</b>	Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures
<b>LEAD AGENCY</b>	City of Bossier City Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	<ol style="list-style-type: none"> <li>1. Enhance and develop emergency services, including response.</li> <li>2. Protect lives and property from the dangers of natural hazards.</li> </ol>
<b>PRIORITY</b>	High
<b>Action Description</b>	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Structure and Infrastructure Projects, Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Eliminates flooding risk of repetitive and severe repetitive loss structures.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Levee Failure, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS CITY OF BOSSIER CITY	
	DESCRIPTION
<b>CITY OF BOSSIER CITY MITGATION ACTION 4</b>	Safe Room Projects
<b>LEAD AGENCY</b>	City of Bossier City Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Construction of a safe room for first responders located in Bossier City. Other locations will be identified based on funding availability.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Allows for continued operations of essential personal to actively respond during a natural hazard event
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS CITY OF BOSSIER CITY	
	DESCRIPTION
<b>CITY OF BOSSIER CITY MITIGATION ACTION 5</b>	Education and Outreach
<b>LEAD AGENCY</b>	City of Bossier City Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for dam and levee failure, drought, flooding, thunderstorms, tornadoes, tropical cyclones, wildfires, and winter weather hazards as well as providing information on high risk areas
<b>Type of Mitigation Action</b>	Education and Awareness Programs
<b>How Action Aligns with Risk Reduction</b>	Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Drought, Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS CITY OF BOSSIER CITY	
	DESCRIPTION
<b>CITY OF BOSSIER CITY MITGATION ACTION 6</b>	Warning Systems
<b>LEAD AGENCY</b>	City of Bossier City Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Update/upgrade public warning system components throughout Bossier City as necessary. Install audible and/or reverse 911 warning system(s).
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	An upgraded public warning system will increase the likelihood of public notification immediately prior to an event
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Levee Failure, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS CITY OF BOSSIER CITY	
	DESCRIPTION
<b>CITY OF BOSSIER CITY MITIGATION ACTION 7</b>	Levee Failure Working Group
<b>LEAD AGENCY</b>	City of Bossier City Mayor's Office
<b>SUPPORTING AGENCIES</b>	US Army Corps of Engineers, Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Create a working group in order to assess the extent and determine the possible impact of a levee failure.
<b>Type of Mitigation Action</b>	Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Creation of working group will allow levees to be assessed and determine the specific areas of inundation related to levee failure.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Levee Failure

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS CITY OF BOSSIER CITY	
	DESCRIPTION
<b>CITY OF BOSSIER CITY MITIGATION ACTION 8</b>	Drought Ordinances
<b>LEAD AGENCY</b>	City of Bossier City Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Adopt ordinances requiring water-saving measures in time of drought.
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Adopting water saving ordinances will allow for water to be regulated and distributed throughout the community when drought related events are imminent
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Drought

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS CITY OF BOSSIER CITY	
	DESCRIPTION
<b>CITY OF BOSSIER CITY MITGATION ACTION 9</b>	Wildfire Ordinance
<b>LEAD AGENCY</b>	City of Bossier City Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HGMP, BRIC, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Strengthen penalties and improve enforcement capabilities of burn ban ordinances
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Natural Systems Protection
<b>How Action Aligns with Risk Reduction</b>	Enforcing penalties on the public that disregards burn ban ordinances will decrease the likelihood of burning to take place thus reducing the risk of wildfire and vegetation loss
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Wildfires

## Town of Haughton Mitigation Actions

*Previous Action Update*

Town of Haughton Mitigation Action Update						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
HAU1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Haughton Mitigation Action 1)
HAU2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Flooding, Tropical Cyclones	In Progress
HAU3: Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Flooding, Tropical Cyclones,	In Progress
HAU4: Safe Room Projects	Construction of a safe room for first responders located in Haughton. Other locations will be identified based on funding availability.	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Haughton Mitigation Action 2)

HAU5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires and Winter Weather hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	In Progress
HAU6: Generators for Continuity of Operations and Government	Procurement and installation of generators at public facilities to ensure continued operations during and after events.	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	In Progress
HAU7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property	HGMP, BRIC, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Thunderstorms	Completed
HAU8: Warning Systems	Update/upgrade public warning system components throughout Haughton as necessary. Install audible and/or reverse 911 warning system(s)	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Haughton Mitigation Action 3)
HAU9: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Flooding, Tropical Cyclones	Not Started - Carried Over (See Town of Haughton Mitigation Action 4)
HAU10: Dam and Levee Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam and/or levee failure.	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Dam Failure, Flooding, Levee Failure, Tropical Cyclones	Deleted – Action not applicable to Haughton

HAU11: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	HGMP, BRIC, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Drought	In Progress
HAU12: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	HGMP, BRIC, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Wildfires	Not Started - Carried Over (See Town of Haughton Mitigation Action 5)
HAU13: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals, and provide protection of potable water supply by acquisition/ installation of backflow preventers at appropriate critical locations.	HGMP, BRIC, FMA, Local	1-5 years	Town of Haughton Mayor's Office/ Bossier Parish Police Jury	Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Haughton Mitigation Action 6)

*New Mitigation Actions*

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF HAUGHTON	
	DESCRIPTION
<b>TOWN OF HAUGHTON MITGATION ACTION 1</b>	Building Retrofits
<b>LEAD AGENCY</b>	Town of Haughton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, FMA, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Retrofit public buildings exterior shell to maintain use during and after storm events
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Reduces damage from high wind related events and helps assure that the public buildings can be used, occupied and operable during or after storms.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF HAUGHTON	
	DESCRIPTION
<b>TOWN OF HAUGHTON MITIGATION ACTION 2</b>	Safe Room Projects
<b>LEAD AGENCY</b>	Town of Haughton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, FMA, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Construction of a safe room for first responders located in Haughton. Other locations will be identified based on funding availability.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Allows for continued operations of essential personal to actively respond during a natural hazard event
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF HAUGHTON	
	DESCRIPTION
<b>TOWN OF HAUGHTON MITIGATION ACTION 3</b>	Warning Systems
<b>LEAD AGENCY</b>	Town of Haughton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, FMA, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Update/upgrade public warning system components throughout Haughton as necessary. Install audible and/or reverse 911 warning system(s).
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	An upgraded public warning system will increase the likelihood of public notification immediately prior to an event
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF HAUGHTON	
	DESCRIPTION
<b>TOWN OF HAUGHTON MITIGATION ACTION 4</b>	Promote Flood Insurance
<b>LEAD AGENCY</b>	Town of Haughton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, FMA, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).
<b>Type of Mitigation Action</b>	Education and Awareness Programs
<b>How Action Aligns with Risk Reduction</b>	Educating the public on flood insurance will allow public to obtain insurance at a cost that's affordable to them and will help gain relief to their home and personal items during post-flood events
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF HAUGHTON	
	DESCRIPTION
<b>TOWN OF HAUGHTON MITIGATION ACTION 5</b>	Wildfire Ordinance
<b>LEAD AGENCY</b>	Town of Haughton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HGMP, BRIC, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Strengthen penalties and improve enforcement capabilities of burn ban ordinances
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Natural Systems Protection
<b>How Action Aligns with Risk Reduction</b>	Enforcing penalties on the public that disregards burn ban ordinances will decrease the likelihood of burning to take place thus reducing the risk of wildfire and vegetation loss
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Wildfires

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF HAUGHTON	
	DESCRIPTION
<b>TOWN OF HAUGHTON MITIGATION ACTION 6</b>	Potable Water
<b>LEAD AGENCY</b>	Town of Haughton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, FMA, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Creating a redundancy of potable water for critical facilities will reduce downtime and allow for the continuity of essential operations during and after an event.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF HAUGHTON	
	DESCRIPTION
<b>TOWN OF HAUGHTON MITIGATION ACTION 7</b>	Enhance Landscaping and Design Measures
<b>LEAD AGENCY</b>	Town of Haughton Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Incentivize drought-tolerant landscape which will reduce the dependence on irrigation practices, using permeable driveways and surfaces to reduce runoff and promote groundwater recharge, and provide incentives for the public that engages in these practices
<b>Type of Mitigation Action</b>	Natural Systems Protection
<b>How Action Aligns with Risk Reduction</b>	Enhancing landscape and design measures allows for drought events to be less severe.
<b>Current Status of Action</b>	New
<b>Hazard Addressed</b>	Drought

## Town of Plain Dealing Mitigation Actions

*Previous Action Update*

Town of Plain Dealing						
Jurisdiction-Specific Action	Action Description	Funding Source	Target Completion Date	Responsible Party, Agency, or Department	Hazard	Status
PD1: Building Retrofits	Retrofit public buildings exterior shell to maintain use during and after storm events. Benefits: Reduces damage from high winds, and helps assure that the public buildings can be used, occupied and operable during or after storms.	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 1)
PD2: Drainage Improvement	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation. Benefits: Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Flooding, Tropical Cyclones	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 2)
PD3: Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Dam Failure, Flooding, Tropical Cyclones	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 3)
PD4: Safe Room Projects	Construction of a safe room for first responders located in Plain Dealing. Other locations will be identified based on funding availability.	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ GOHSEP/ Bossier Parish OHSEP	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 4)

PD5: Education and Outreach	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for Dam Failure, Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires and Winter Weather hazards as well as providing information on high risk areas. Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Dam Failure, Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 5)
PD6: Generators for Continuity of Operations and Government	Procurement and installation of generators at public facilities to ensure continued operations during and after events.	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 6)
PD7: Lightning Mitigation	Procurement and installation of lightning rods and surge protectors for public buildings to preserve life and property	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Thunderstorms	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 7)
PD8: Warning Systems	Update/upgrade public warning system components throughout Plain Dealing as necessary. Install audible and/or reverse 911 warning system(s)	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish OHSEP	Dam Failure, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 8)
PD9: Promote Flood Insurance	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Flooding, Dam Failure, Tropical Cyclones	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 9)

PD10: Dam Failure Working Group	Create a working group in order to assess the extent and determine the possible effects of a dam failure.	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish OHSEP/ USACE	Dam Failure, Flooding, Tropical Cyclones	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 10)
PD11: Drought Ordinances	Adopt ordinances requiring water-saving measures in time of drought.	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Drought	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 11)
PD12: Wildfire Ordinances	Strengthen penalties and improve enforcement capabilities of burn ban ordinances	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Wildfires	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 12)
PD13: Potable Water	Create redundancy of potable water supply to critical facilities, especially hospitals, and provide protection of potable water supply by acquisition/ installation of backflow preventers at appropriate critical locations.	HGMP, BRIC, Local	1-5 years	Town of Plain Dealing Mayor's Office/ Bossier Parish Police Jury	Dam Failure, Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather	Not Started - Carried Over (See Town of Plain Dealing Mitigation Action 13)

*New Mitigation Actions*

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 1</b>	Building Retrofits
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Retrofit public buildings exterior shell to maintain use during and after storm events
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Reduces damage from high wind related events, and helps assure that the public buildings can be used, occupied and operable during or after storms.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 2</b>	Drainage Improvements
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Will relieve flooding problems, reduce flood damage and costs of damage, overtopping of roads with drain water, while also keeping open roadways during periods of high precipitation.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Relieves Parish or local government and property owners of the continual flooding problems, with closed roadways (loss of function). Saves public funds for road repairs, drainage ditch repairs, sandbagging and blocking of roadways during storm periods.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 3</b>	Mitigation of Repetitive Loss and Severe Repetitive Loss Properties and Other Hazard Prone Structures
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	<ol style="list-style-type: none"> <li>1. Enhance and develop emergency services, including response.</li> <li>2. Protect lives and property from the dangers of natural hazards.</li> </ol>
<b>PRIORITY</b>	High
<b>Action Description</b>	Elevation, acquisition-demolition, acquisition-relocations, and reconstruction of repetitive loss or flooding or other hazard prone properties.
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Structure and Infrastructure Projects, Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Eliminates flooding risk of repetitive and severe repetitive loss structures.
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Dam Failure, Flooding, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 4</b>	Safe Room Projects
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP, GOHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HMGP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Construction of a safe room for first responders located in Plain Dealing. Other locations will be identified based on funding availability.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Allows for continued operations of essential personal to actively respond during a natural hazard event
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 5</b>	Education and Outreach
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Enhance the public outreach programs for the parish and all communities by increasing awareness of risks and safety for dam and levee failure, drought, flooding, thunderstorms, tornadoes, tropical cyclones, wildfires, and winter weather hazards as well as providing information on high risk areas
<b>Type of Mitigation Action</b>	Education and Awareness Programs
<b>How Action Aligns with Risk Reduction</b>	Informing communities, business and citizens on proper mitigation efforts and activities will create resiliency within the parish and its communities.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Dam Failure, Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 6</b>	Generators for Continuity of Operations and Government
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Procurement and Installation of generators at public facilities to ensure continued operations during and after events.
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Installation of generators will allow public facilities to run accordingly and aid with local relief efforts
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 7</b>	Lightning Mitigation
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Procurement and Installation of Lightning rods and surge protectors for public buildings to preserve life and property
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	The installation of lightning rods and surge protectors in public buildings and critical infrastructure will reduce losses due to lightning strikes and surges in electricity.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Thunderstorms

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 8</b>	Warning Systems
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Update/upgrade public warning system components throughout Plain Dealing as necessary. Install audible and/or reverse 911 warning system(s).
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	An upgraded public warning system will increase the likelihood of public notification immediately prior to an event
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Dam Failure, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 9</b>	Promote Flood Insurance
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Promote the purchase of flood insurance. Advertise the availability, cost, and coverage of flood insurance through the National Flood Insurance Program (NFIP).
<b>Type of Mitigation Action</b>	Education and Awareness Programs
<b>How Action Aligns with Risk Reduction</b>	Educating the public on flood insurance will allow public to obtain insurance at a cost that's affordable to them and will help gain relief to their home and personal items during post-flood events
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Dam Failure, Flooding, Tropical Cyclones

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 10</b>	Dam Failure Working Group
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	US Army Corps of Engineers, Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Create a working group in order to assess the extent and determine the possible impact of a dam failure
<b>Type of Mitigation Action</b>	Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Creation of working group will allow levees to be assessed and determine the specific areas of inundation related to dam failure.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Dam Failure, Flooding

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 11</b>	Drought Ordinances
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Adopt ordinances requiring water-saving measures in time of drought.
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Natural System Protection
<b>How Action Aligns with Risk Reduction</b>	Adopting water saving ordinances will allow for water to be regulated and distributed throughout the community when drought related events are imminent
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Drought

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 12</b>	Wildfire Ordinance
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HGMP, BRIC, Local
<b>ASSOCIATED GOALS</b>	2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Strengthen penalties and improve enforcement capabilities of burn ban ordinances
<b>Type of Mitigation Action</b>	Local Plans and Regulations, Natural Systems Protection
<b>How Action Aligns with Risk Reduction</b>	Enforcing penalties on the public that disregards burn ban ordinances will decrease the likelihood of burning to take place thus reducing the risk of wildfire and vegetation loss
<b>Current Status of Action</b>	Not Started – Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Wildfires

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 13</b>	Potable Water
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish Police Jury
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	FEMA HGMP, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	Medium
<b>Action Description</b>	Create redundancy of potable water supply to critical facilities, especially hospitals in Parish, and provide protection of potable water supply by acquisition/installation of backflow preventers at appropriate critical locations.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Creating a redundancy of potable water for critical facilities will reduce downtime and allow for the continuity of essential operations during and after an event.
<b>Current Status of Action</b>	Not Started - Carried Over from 2017 Plan
<b>Hazard Addressed</b>	Dam Failure, Drought, Flooding, Thunderstorms, Tornadoes, Tropical Cyclones, Wildfires, Winter Weather

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 14</b>	Construction of Floodwalls for Inundation Zones
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, FMA, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Construct floodwalls for communities and/or the parish that are in inundation zones and can be impacted by the failure of a High Hazard Potential Dam (HHPD). The parish will work alongside with the Dam Failure Working Group and the State of Louisiana to determine where inundation zones are in the parish and where floodwalls will need to be placed.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Construction of floodwalls for communities will reduce the risk of flooding from a HHPD failure and reduce the risk of loss of life/property.
<b>Current Status of Action</b>	New
<b>Hazard Addressed</b>	Dam Failure, Flooding

IMPLEMENTATION KEY FOR POTENTIAL HAZARD MITIGATION ACTIONS TOWN OF PLAIN DEALING	
	DESCRIPTION
<b>TOWN OF PLAIN DEALING MITIGATION ACTION 15</b>	Auxiliary Spillway Addition for HHPD's in Bossier Parish
<b>LEAD AGENCY</b>	Town of Plain Dealing Mayor's Office
<b>SUPPORTING AGENCIES</b>	Bossier Parish OHSEP
<b>TIMELINE</b>	1-5 years
<b>COST ESTIMATE</b>	Unknown
<b>POSSIBLE FUNDING SOURCE(S)</b>	HMGP, BRIC, FMA, Local
<b>ASSOCIATED GOALS</b>	1. Enhance and develop emergency services, including response. 2. Protect lives and property from the dangers of natural hazards.
<b>PRIORITY</b>	High
<b>Action Description</b>	Addition of an auxiliary spillway will allow HHPD's in Bossier Parish to hold more water and prevent overtopping causing the surrounding areas to flood.
<b>Type of Mitigation Action</b>	Structure and Infrastructure Projects
<b>How Action Aligns with Risk Reduction</b>	Addition of an auxiliary spillway will allow HHPD's in Bossier Parish to hold more water and prevent overtopping causing the surrounding areas to flood.
<b>Current Status of Action</b>	New
<b>Hazard Addressed</b>	Dam Failure, Flooding

## Action Prioritization

During the prioritization process, the planning committee considered the costs and relative benefits of each new action. Costs can usually be listed in terms of dollars, although at times it involves staff time rather than the purchase of equipment or services that can be readily measured in dollars. In most cases, benefits, such as lives saved or future damage prevented, are hard to measure in dollars. Therefore, many projects were prioritized with these factors in mind. In addition, prioritization of the mitigation actions was performed based on the following economic criteria: i) whether the action can be performed with the existing parish resources; ii) whether the action requires additional funding from external sources; and iii) relative costs of the mitigation actions.

In all cases, the committee concluded that the benefits (in terms of reduced property damage, lives saved, health problems averted and/or economic harm prevented) outweighed the costs for the recommended action items.

The planning committee prioritized the possible activities that could be pursued. Planning committee members consulted appropriate agencies in order to assist with the prioritizations. The results were items that address the major hazards, are appropriate for those hazards, are cost-effective, and are affordable. On-going actions, as well as actions which will provide maximum benefit that can be undertaken by existing parish staff with or without additional external funding were given high priority. The actions with medium benefit and relatively low cost, political support, and public support but require additional funding from parish or external sources were given medium priority. The actions that require substantial funding from external sources and would result in limited benefit to the community were given low priority.

Bossier Parish and the incorporated jurisdictions will implement and administer the identified actions based off the proposed timeframes and priorities for each reflected in the portions of this section where actions are summarized. The inclusion of any specific action item in this document does not commit the parish to implementation. Each action item will be subject to availability of staff and funding. Certain items may require regulatory changes or other decisions that must be implemented through standard processes. This plan is intended to offer priorities based on an examination of hazards.

Bossier Parish and the Planning Committee have exercised the motion to place a high priority on all actions pertaining to High Hazard Profile Dams (HHPD) in an effort to reduce the risk of dam failure. Those actions pertaining to the structural assessment of HHPD have been designated a "High" level action prioritization. Those actions pertaining to significant hazard dams or actions evolving around a working group, have been designated a "Medium" level action prioritization.

## Appendix A: Planning Process

### Purpose

The Hazard Mitigation Plan Update process prompts local jurisdictions to keep their hazard mitigation plan current and moving toward a more resilient community. The plan update builds on the research and planning efforts of previous plans while reviewing recent trends. The planning committee followed FEMA's hazard mitigation planning process per the FEMA Local Mitigation Planning Handbook. This planning process assured public involvement and the participation of interested agencies and private organizations. Documentation of the planning process for the updated plan is addressed in this section.

### The Bossier Parish Hazard Mitigation Plan Update

The Bossier Parish Hazard Mitigation Plan Update process began in September 2022 with a series of emails, phone calls, meetings, and collaborations between the contractor (SDMI) and a diverse group of participating agencies and stakeholders. Update activities were intended to give each participating agency and stakeholder the opportunity to shape the plan to best fit their community's mitigation goals. Community stakeholders and the general public were invited to attend and contribute information to the planning process during specific time periods or meetings.

The table below details the meeting schedule and purpose for the planning process:

Date	Meeting or Outreach	Location	Public Invited	Purpose
9/20/2022	Kick Off Meeting	Zoom Call	No	Discuss with the Parish OHSEP Director expectations and requirements of the project. Discuss meeting schedules, committee make up, and next steps.
10/20/2022	Initial Planning Committee Meeting	Benton, LA	No	Discuss with Bossier Parish Hazard Mitigation Planning Committee the process and expectations of plan participants. Discuss timeline and action items for parish and each jurisdiction.
6/22/2023	Planning Committee Risk Assessment Review	Benton, LA	Yes	Presentation of Risk Assessment and profiled hazards to Planning Committee.
6/22/2023	Public Meeting	Benton, LA	Yes	Presentation of Risk Assessment s and profiled hazards to public. Presentation also includes current mitigation project highlights within communities and public survey discussion.
10/1/2022 – 7/10/2023	Public Opinion Survey	Online	Yes	This survey asked participants about public perceptions and opinions regarding natural hazards in Bossier Parish. In addition, questions covered the methods and techniques preferred for reducing the risks and losses associated with these hazards. Link to the survey can be found here: <a href="https://www.surveymonkey.com/r/BossierHM2022">https://www.surveymonkey.com/r/BossierHM2022</a>

## Planning

The plan update process consisted of several phases:

	Month 1-2	Month 3-4	Month 5-6	Month 7-8	Month 9-10	Month 11-12	Month 13-14	Month 15-16
<b>Plan Revision</b>	■							
<b>Data Collection</b>	■							
<b>Risk Assessment</b>	■							
<b>Public Input</b>		■						
<b>Mitigation Strategy</b>			■					
<b>Plan Review by GOHSEP and FEMA</b>					■			
<b>FEMA APA</b>							■	
<b>Plan Adoptions</b>							■	
<b>Final Plan Approval</b>								■

## Coordination

The Bossier Parish Office of Homeland Security and Emergency Preparedness (OHSEP) oversaw the coordination of the 2023 Hazard Mitigation Plan Update Planning Committee during the update process. The parish OHSEP was responsible for identifying members for the committee. Representatives of relevant local and parish government departments were invited for inclusion in the planning process via email. The parish OHSEP also attempted to include members of private and nonprofit organizations within the parish, but did not receive a response. Bossier Parish also reached out to organizations that provide for the betterment and benefit of populations identified as socially vulnerable so that they could be involved in the plan update process, but no response was received. There are no higher education institutions in Bossier Parish; therefore, no members of academia could be included in the planning process.

The Parish Director was responsible for inviting the planning committee and key stakeholders to scheduled meetings and activities via phone call and/or email. SDMI assisted the Parish Director with press releases and social media statements for notification to the media and general public for public meetings and public outreach activities.

SDMI was responsible for facilitating all meetings and outreach efforts during the update process.

## Neighboring Community, Local and Regional Planning Process Involvement

From the outset of the planning process, the planning committee encouraged participation from a broad range of parish entities. The involvement of representatives from the city, state, and regional agencies provided diverse perspectives and mitigation ideas.

Formal participation in this plan includes but is not limited to the following activities:

- Participation in Hazard Mitigation planning meetings at the local and parish level
- Community Rating System Meetings and coordination
- Sharing local data and information with jurisdictions
- Incorporation of other planning documents, studies and efforts
- Action item development and action progress from 2017 update
- Risk Assessment review
- Plan document draft review
- Formal adoption of the Hazard Mitigation Plan

The Caddo and Webster Parish OHSEP Directors were invited to attend the Kickoff, Initial Planning, and Risk Assessment Meetings for Bossier Parish in an effort to coordinate mitigation efforts where possible as neighboring communities. The Caddo and Webster OHSEP Directors were invited via email and phone call to participate in an effort to collaborate with neighboring communities. SDMI assisted Bossier Parish with encouraging the collaboration with these neighboring communities via email by extending an invitation to the Bossier Hazard Mitigation Plan Update Meetings.

As part of the coordination and planning process, the parish was provided the State Required Hazard Mitigation Plan Update Worksheet. The completed worksheets can be found in [Appendix E: State Required Worksheets](#).

The 2023 Hazard Mitigation Plan Update Planning Committee consisted of representatives from the following parish, municipal or community stakeholders. Below is a detailed list of the 2023 HMPU Planning Committee:

Bossier Parish Hazard Mitigation Planning Committee			
Name	Title	Agency	Email
Ian Snellgrove	Director OHSEP	Bossier Parish OHSEP	<a href="mailto:isnellgrove@bohsep.org">isnellgrove@bohsep.org</a>
Gene Barattini	Deputy Director OHSEP	Bossier Parish OHSEP	<a href="mailto:gbarattini@bohsep.org">gbarattini@bohsep.org</a>
Shelly Horton	Mayor	Town of Benton	<a href="mailto:bentonmayor11@gmail.com">bentonmayor11@gmail.com</a>
Shavonda Gay	Mayor	Town of Plain Dealing	<a href="mailto:pdmayor@centurytel.net">pdmayor@centurytel.net</a>
Rolandria McCauley	Town Clerk	Town of Plain Dealing	<a href="mailto:pdealing@centurytel.net">pdealing@centurytel.net</a>
Kim Gaspard	Mayor	Town of Haughton	<a href="mailto:kgaspard@haughton.la.gov">kgaspard@haughton.la.gov</a>
Amanda Nottingham	CAO	City of Bossier City	<a href="mailto:nottinghama@bossiercity.org">nottinghama@bossiercity.org</a>
Ben Raushenbach	Engineer	City of Bossier City	<a href="mailto:brauschenbach@manchacgroup.com">brauschenbach@manchacgroup.com</a>
Clinton Patrick	Engineer	City of Bossier City	<a href="mailto:cpatrick@manchacgroup.com">cpatrick@manchacgroup.com</a>
Butch Ford	Parish Administrator	Bossier Parish Police Jury	<a href="mailto:jford@bossierparishla.gov">jford@bossierparishla.gov</a>
Eric Hudson	Engineer	Bossier Parish Police Jury	<a href="mailto:ehudson@bossierparishla.gov">ehudson@bossierparishla.gov</a>
Nguyen Kha	Asst. Engineer	Bossier Parish Police Jury	<a href="mailto:nkha@bossierparishla.gov">nkha@bossierparishla.gov</a>
Matt Redmon	Asst. Engineer	Bossier Parish Police Jury	<a href="mailto:MRedmon@bossierparishla.gov">MRedmon@bossierparishla.gov</a>
Jessica Aldridge	Administration	Bossier Parish Police Jury	<a href="mailto:jaldridge@bossierparishla.gov">jaldridge@bossierparishla.gov</a>
Monica Grappe	Administration	Bossier Parish Police Jury	<a href="mailto:mgrappe@bossierparishla.gov">mgrappe@bossierparishla.gov</a>
Pat Culverhouse	PIO	Bossier Parish Police Jury	<a href="mailto:pculverhouse1@gmail.com">pculverhouse1@gmail.com</a>
Robert Jump	Deputy Director OHSEP	Caddo Parish OHSEP	<a href="mailto:robert.jump@caddosheriff.org">robert.jump@caddosheriff.org</a>
Brian Williams	Director OHSEP	Webster Parish OHSEP	<a href="mailto:webster_ohsep@gmail.com">webster_ohsep@gmail.com</a>
Todd Derrick	Regional Coordinator	GOHSEP	<a href="mailto:Todd.Derrick2@la.gov">Todd.Derrick2@la.gov</a>

## Program Integration

Local governments are required to describe how their mitigation planning process is integrated with other ongoing local and area planning efforts. This subsection describes Bossier Parish programs and planning.

A measure of integration and coordination is achieved through the HMPU participation of planning committee members and community stakeholders who administer programs such as: floodplain management under the National Flood Insurance Program (NFIP), Community Rating System, parish planning and zoning and building code enforcement.

Bossier Parish will continue to integrate the requirements of this Hazard Mitigation Plan into other local planning mechanisms that are to be identified through future meetings of the parish, and through the five-year review process described in [Appendix B: Plan Maintenance](#). The primary means for integrating mitigation strategies into other local planning mechanisms will be through the revision, update and implementation of any individual municipal plans that require specific planning and administrative tasks (e.g. risk assessment, plan amendments, ordinance revisions, capital improvement projects, etc.).

The members of the Bossier Parish Hazard Mitigation Planning Committee will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their communities or agencies are consistent with the goals and actions of the Hazard Mitigation Plan and will not contribute to increased hazard vulnerability in the parish. Existing plans, studies, and technical information were incorporated in the planning process. Examples include flood data from FEMA and the U. S. Geological Survey. Much of this data was incorporated into the Risk Assessment component of the plan relative to plotting historical events and the magnitude of damages that occurred. The parish's 2017 Hazard Mitigation Plan was also used in the planning process. Other existing data and plans used in the planning process include those listed below.

- Parish Emergency Operations Plan
- Stormwater Management Plan
- Flood Insurance Rate Maps
- State of Louisiana Hazard Mitigation Plan

Further information on the plans can be found in [Section 3: Capability Assessment](#).

## Meeting Documentation and Public Outreach Activities

The following pages contain documentation of the meetings and public outreach activities conducted during this hazard mitigation plan update.

### Meeting #1: Hazard Mitigation Plan Update Kick-Off

**Date:** September 20, 2022

**Location:** Zoom Call

**Purpose:** Discuss with the Parish OHSEP Director expectations and requirements of the project. Discuss meeting schedules, committee make up, and next steps.

**Public Invitation:** No

**Meeting Invitees:**

Bossier Parish Hazard Mitigation Planning Committee		
Name	Title	Agency
Ian Snellgrove	Director	Bossier Parish OHSEP
Chris Rippetoe	Program Manager	LSU-SDMI

### Meeting #2: Hazard Mitigation Plan Update Initial Planning Committee Meeting

**Date:** October 20, 2022

**Location:** Benton, LA

**Purpose:** Discuss the expectations and requirements of the hazard mitigation plan update process and establish an initial project timeline with the Parish's Hazard Mitigation Plan Planning Committee. Assign each individual tasks related to the parish data collection for the plan update.

**Public Invitation:** No

**Meeting Invitees:**

Bossier Parish Hazard Mitigation Planning Committee		
Name	Title	Agency
Ian Snellgrove	Director OHSEP	Bossier Parish OHSEP
Gene Barattini	Deputy Director OHSEP	Bossier Parish OHSEP
Shelly Horton	Mayor	Town of Benton
Shavonda Gay	Mayor	Town of Plain Dealing
Rolandria McCauley	Town Clerk	Town of Plain Dealing
Kim Gaspard	Mayor	Town of Haughton
Amanda Nottingham	CAO	City of Bossier City
Ben Raushenbach	Engineer	City of Bossier City
Clinton Patrick	Engineer	City of Bossier City
Butch Ford	Parish Administrator	Bossier Parish Police Jury
Eric Hudson	Engineer	Bossier Parish Police Jury
Nguyen Kha	Asst. Engineer	Bossier Parish Police Jury
Matt Redmon	Asst. Engineer	Bossier Parish Police Jury
Jessica Aldridge	Administration	Bossier Parish Police Jury
Monica Grappe	Administration	Bossier Parish Police Jury
Pat Culverhouse	Public Information Officer	Bossier Parish Police Jury
Robert Jump	Deputy Director OHSEP	Caddo Parish OHSEP
Brian Williams	Director OHSEP	Webster Parish OHSEP
Todd Derrick	Regional Coordinator	GOHSEP

**Meeting #3: Hazard Mitigation Plan Update Planning Committee Risk Assessment Review****Date:** June 22, 2023**Location:** Benton, LA**Purpose:** Presentation of Risk Assessment hazards and maps to Planning Committee.**Public Invitation:** No**Meeting Invitees:**

Bossier Parish Hazard Mitigation Planning Committee		
Name	Title	Agency
Ian Snellgrove	Director OHSEP	Bossier Parish OHSEP
Gene Barattini	Deputy Director OHSEP	Bossier Parish OHSEP
Shelly Horton	Mayor	Town of Benton
Shavonda Gay	Mayor	Town of Plain Dealing
Rolandria McCauley	Town Clerk	Town of Plain Dealing
Kim Gaspard	Mayor	Town of Haughton
Amanda Nottingham	CAO	City of Bossier City
Ben Raushenbach	Engineer	City of Bossier City
Clinton Patrick	Engineer	City of Bossier City
Butch Ford	Parish Administrator	Bossier Parish Police Jury
Eric Hudson	Engineer	Bossier Parish Police Jury
Nguyen Kha	Asst. Engineer	Bossier Parish Police Jury
Matt Redmon	Asst. Engineer	Bossier Parish Police Jury
Jessica Aldridge	Administration	Bossier Parish Police Jury
Monica Grappe	Administration	Bossier Parish Police Jury
Pat Culverhouse	Public Information Officer	Bossier Parish Police Jury
Robert Jump	Deputy Director OHSEP	Caddo Parish OHSEP
Brian Williams	Director OHSEP	Webster Parish OHSEP
Todd Derrick	Regional Coordinator	GOHSEP

**Meeting #4: Hazard Mitigation Plan Update Public Meeting****Date:** June 22, 2023**Location:** Benton, LA

**Purpose:** The Public Meeting allowed the public and community stakeholders to participate and provide input into the hazard mitigation planning process. Presentation also included highlights of current mitigation projects highlights, as well as public survey discussion. The public meeting notice on the following page was presented to stakeholders as well as the general public, including those in underserved communities and those populations deemed as socially vulnerable. This effort was carried out by Bossier Parish, and with assistance from SDMI, so that these certain populations were presented with the opportunity to be invited to attend the public meeting and provide feedback to this plan update. This notice was distributed via email as well as posted on the front door of the courthouse and posted via social media.

**Public Invitation:** Yes**Meeting Invitees:**

Bossier Parish Hazard Mitigation Planning Committee		
Name	Title	Agency
Ian Snellgrove	Director OHSEP	Bossier Parish OHSEP
Gene Barattini	Deputy Director OHSEP	Bossier Parish OHSEP
Shelly Horton	Mayor	Town of Benton
Shavonda Gay	Mayor	Town of Plain Dealing
Rolandria McCauley	Town Clerk	Town of Plain Dealing
Kim Gaspard	Mayor	Town of Haughton
Amanda Nottingham	CAO	City of Bossier City
Ben Raushenbach	Engineer	City of Bossier City
Clinton Patrick	Engineer	City of Bossier City
Butch Ford	Parish Administrator	Bossier Parish Police Jury
Eric Hudson	Engineer	Bossier Parish Police Jury
Nguyen Kha	Asst. Engineer	Bossier Parish Police Jury
Matt Redmon	Asst. Engineer	Bossier Parish Police Jury
Jessica Aldridge	Administration	Bossier Parish Police Jury
Monica Grappe	Administration	Bossier Parish Police Jury
Pat Culverhouse	Public Information Officer	Bossier Parish Police Jury
Robert Jump	Deputy Director OHSEP	Caddo Parish OHSEP
Brian Williams	Director OHSEP	Webster Parish OHSEP
Todd Derrick	Regional Coordinator	GOHSEP

**Meeting Announcement:**

BOSSIER PARISH OFFICE OF HOMELAND SECURITY & EMERGENCY PREPAREDNESS

**PUBLIC MEETING ANNOUNCEMENT****Bossier Parish and its partners are seeking community input for the 2023 Bossier Parish Hazard Mitigation Plan update!**

Bossier Parish OHSEP, in partnership with The Louisiana Governor's Office of Homeland Security and Emergency Preparedness and the Stephenson Disaster Management Institute at LSU, is leading the process to update the plan. The Bossier Parish Hazard Mitigation Multi-Jurisdictional Plan describes the **naturally occurring** risks to the region and outlines strategies to reduce these risks to save lives, reduce property damage, and lessen the impact of future disasters.

Are you passionate about building a more resilient future for your parish? Do you have questions about the natural hazards your community is at risk to? Please join us on Thursday, June 22, for a public meeting at 10AM to learn more about the plan and share your input on the risks and vulnerabilities that most impact you and your community.

**Meeting Location:**

Bossier Parish Courthouse  
204 Burt Blvd.  
Benton, LA 71006

Residents of Bossier Parish are asked to participate in a survey about public perceptions and opinions regarding natural hazards in the parish. The survey results will be used in the development of the plan. This short web-based survey can be found at the following link:

<https://www.surveymonkey.com/r/BossierHM2022>

The Parish appreciates your input.

If you have questions, please contact the Bossier Parish OHSEP Office

### Outreach Activity #1: Public Opinion Survey

**Date:** Ongoing throughout planning process

**Location:** Web survey

**Public Invitation:** Yes

As referenced in the *Mitigation Strategy* section of this document, an online public opinion survey of Bossier Parish residents was conducted between October 2022 and July 2023. The survey was designed to capture public perceptions and opinions regarding natural hazards in Bossier Parish. In addition, the survey collected information regarding the methods and techniques preferred by the respondents for reducing the risks and losses associated with local hazards. As of July 10<sup>th</sup>, there were no responses to the survey so therefore no public input could be incorporated in this plan update. The full survey can be found at the following link: <https://www.surveymonkey.com/r/BossierHM2022>

### Outreach Activity #2: Public Meeting Activity - Incident Questionnaire

**Date:** June 22, 2023

**Location:** Public Meeting

**Public Invitation:** Yes

An incident/issue questionnaire was provided at the public meeting in an effort to collect additional information from residents of Bossier Parish regarding hazard events and their localized impacts. While the information collected via the questionnaire was to be integrated into this planning document, there was no public turnout for the meeting, and subsequently no results could be collected. A copy of the incident questionnaire can be found on the next page.

### Outreach Activity #3: 2023 Bossier Parish Hazard Mitigation Plan Public Review

**Date:** Ongoing

**Location:** SDMI Hazard Mitigation Website

**Public Initiation:** Yes

After an initial review by the Bossier Parish Planning Committee was completed, the 2023 Bossier Parish Hazard Mitigation Plan was made available for public review and comment. The plan was hosted on SDMI's Hazard Mitigation website: <https://hmplans.sdmi.lsu.edu/Home/Parish/bossier>

# BOSSIER PARISH PUBLIC MEETING

## PUBLIC ACTIVITY: INCIDENT/ ISSUE QUESTIONNAIRE

### 1. HAZARD TYPE(S):

- A. DAM FAILURE
- B. DROUGHT
- C. EARTHQUAKES
- D. FLOODING
- E. LEVEE FAILURE
- F. THUNDERSTORMS
- G. TORNADOES
- H. TROPICAL CYCLONES
- I. WINTER WEATHER
- J. WILDFIRES

### F. OTHER:

### 2. DESCRIBE INCIDENT OR ISSUE:

Empty text box for describing the incident or issue.

### 3. LOCATION:

A. CITY:

B. ADDRESS OR AREA:

C. LOCALIZED OR DISPERSED:

### 4. INTENSITY

A. DEPTH (FLOODING) OR SIZE (HAIL ETC.):

B. WIND STRENGTH:

### 5. RE-OCCURRING OR ONE-TIME

A. IF RE-OCCURRING, HOW OFTEN?

### 6. WHAT TYPE OF INTERRUPTIONS DOES/ DID THE INCIDENT OR ISSUE CAUSE? (BUSINESS CLOSURE, DAMAGE, EVACUATION, ETC.)

### 7. HOW LONG WAS THE INTERRUPTION (HOURS, DAYS, WEEKS, ETC.)?

### 8. HOW COULD THIS PROBLEM OR IMPACT BE PREVENTED, FIXED OR ALLEVIATED?

## Appendix B: Plan Maintenance

### Purpose

The section of the Code of Federal Regulations (CFR) pertaining to Local Mitigation Plans lists five required components for each plan: a description of the planning process; risk assessments; mitigation strategies; a method and system for plan maintenance; and documentation of plan adoption. This section details the method and system for plan maintenance, following the CFR's guidelines that the Plan Update must include (1) "a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle," (2) "a process by which local governments incorporated the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans", and (3) "discussion on how the community will continue public participation in the plan maintenance process."

### Implementing, Monitoring, Evaluating, and Updating the Plan

The Bossier Parish Hazard Mitigation Planning Committee will be responsible for implementing, monitoring, evaluating, and documenting the plan's progress throughout the year. Part of the plan maintenance process should include a system by which local governing bodies incorporate the HMP into the parish's other applicable plans. This process provides for continued public participation through the diverse resources of the parish to help in achieving the goals and objectives of the plan. Public participation will be achieved through availability of copies of HMP in parish public buildings and the SDMI Hazard Mitigation. This section describes the whole update process which includes the following:

- Responsible parties
- Methods to be used
- Evaluation criteria to be applied
- Scheduling for monitoring and evaluating the plan

### Responsible Parties

Bossier Parish has developed a method to ensure that a regular review and update of this Hazard Mitigation Plan occurs. This will be the responsibility of the planning committee, which consists of representatives from governmental organizations, local businesses, and private citizens, who will be involved in the process of monitoring, evaluating and updating the plan. All committee members in this plan will remain active in the planning committee.

Although the people filling the positions may change from year to year, the parish and its stakeholders will have representatives on the planning committee. The future planning committee will continue to be comprised of the same job functions as currently evident in the planning committee. However, the decision of specific job duties will be left to the Parish OHSEP Director to be assigned as deemed appropriate.

### Methods for Monitoring and Evaluating the Plan and Plan Evaluation Criteria

Bossier Parish has developed a method to ensure monitoring, evaluating, and updating of the HMP occurs during the five-year cycle of the plan. Implementation will be accomplished through constant and transparent efforts to network and highlight the multi-objective, win-win benefits of each project proposed in the *Mitigation Strategy* section. These efforts include the routine actions of monitoring agendas, attending meetings, and promoting a safe and resilient community. The planning committee will seek to become a permanent body and will be responsible for monitoring, evaluating, and updating of the plan. The planning committee meeting will be held annually in order to monitor, evaluate, and update

the plan. The Bossier Parish OHSEP Director will be responsible for conducting the annual planning committee meetings.

The lead person of the agency responsible for the implementation of a specific mitigation action will submit a progress report to the Director at least thirty days prior to the planning committee meeting. The progress report will provide project status monitoring to include the following: whether the project has started; if not started, reason for not starting; if started, status of the project; if the project is completed, whether it has eliminated the problem; and any changes recommended to improve the implementation of the project etc. In addition, the progress report will provide status monitoring on the plan evaluation, changes to the hazard profile, changes to the risk assessment, and public input on the Hazard Mitigation Plan updates and reviews.

Progress on the mitigation action items and projects will be reviewed during the annual planning committee meeting. The criteria that would be utilized in the project review will include the following:

- 1) Whether the action was implemented and reasons, if the action was not implemented
- 2) What were the results of the implemented action
- 3) Were the outcomes as expected, and reasons if the outcomes were not as expected
- 4) Did the results achieve the stated goals and objectives
- 5) Was the action cost-effective
- 6) What were the losses avoided after completion of the project
- 7) In case of a structural project, did it change the hazard profile

In addition to monitoring and evaluating the progress of the mitigation plan actions and projects, the mitigation plan is required to be maintained and monitored annually, and fully updated every five years. The annual maintenance, monitoring and evaluation of the plan will be conducted in the annual planning committee meeting. The planning committee will review each goal to determine their relevance to changing situations in the parish, as well as changes to state or federal policy, and to ensure that they are addressing current and expected conditions. The planning committee will evaluate if any change in hazard profile and risk in the parish occurred during the past year. In addition, the evaluation will include the following criteria in respect of plan implementation:

- 1) Any local staffing changes that would warrant inviting different members to the planning committee
- 2) Any new organizations that would be valuable in the planning process or project implementation need to be included in the planning committee
- 3) Any new or existing procedures that can be done more efficiently
- 4) Any additional ways to gain more diverse and widespread cooperation
- 5) Any different or additional funding sources available for mitigation planning and implementation

The HMP will be updated every five years to remain eligible for continued HMGP funding. The planning committee will be responsible for updating the HMP. The OHSEP Director will be the lead person for the HMP update. The HMP update process will commence at least one year prior to the expiration of the

plan. The HMP will be updated after a major disaster if an annual evaluation of the plan indicates a substantial change in hazard profile and risk assessment in the parish.

Additionally, the public will be canvassed to solicit public input to continue Bossier Parish's dedication to involving the public directly in review and updates of the Hazard Mitigation Plan. Meetings will be scheduled as needed by the plan administrator to provide a forum for which the public can express their concerns, opinions, and/or ideas about the plan. The plan administrator will be responsible for using parish resources to publicize the annual public meetings and maintain public involvement through the newspapers, radio, and public access television channels. Copies of the plan will be catalogued and kept at all appropriate agencies in the city government, as well as on SDMI's HM website.

The review by the planning committee and input from the public will determine whether a plan update is needed prior to the required five-year update.

Annual reports on the progress of actions, plan maintenance, monitoring, evaluation, incorporation into existing planning programs, and continued public involvement will be documented at each annual meeting of the committee and kept by the Parish OHSEP Director. The planning committee will work together as a team, with each member sharing responsibility for completing the monitoring, evaluation and updates. It is the responsibility of the Parish OHSEP Director for contacting committee members, organizing the meeting and providing public noticing for the meeting to solicit public input.

### 2023 Plan Version Plan Method and Schedule Evaluation

For the current plan update, the previously approved plan's method and schedule were evaluated to determine if the elements and processes involved in the required 2023 update. Based on this analysis, the method and schedule were deemed to be acceptable, and nothing was changed for this update.

### Incorporation into Existing Planning Programs

It is and has been the responsibility of the Bossier Parish Hazard Mitigation Plan Planning Committee and participating jurisdictions to determine additional implementation procedures when appropriate. This may include integrating the requirements of the Bossier Parish Hazard Mitigation Plan into each jurisdiction's planning documents, processes, or mechanisms as follows:

- Ordinances, Resolutions, Regulations
- Floodplain Ordinances
- Master Plans
- Capital Improvement Plans
- Economic Development Plans
- Emergency Operations Plans
- Continuity of Operations Plans
- Transportation Plan
- Stormwater Management Plan
- HHPD Emergency Action Plan

Opportunities to integrate the requirements of this plan into other local planning mechanisms will continue to be identified through future meetings of the Bossier Parish Hazard Mitigation Planning Committee and through the five-year review process described herein. The primary means for integrating mitigation strategies into other local planning mechanisms will be through the revision, update and implementation of each jurisdiction's individual plans that require specific planning and administrative

tasks (e.g. risk assessment, plan amendments, ordinance revisions, capital improvement projects, etc.). Specific to High Hazard Profile Dams, community officials and dam owners work very closely to ensure the structural integrity and mitigation efforts of any high hazard dams in the parish.

While there have been no instances of the mitigation strategy being incorporated into other planning documents since the adoption of the 2017 Bossier Hazard Mitigation Plan, the committee members recognize the importance of a holistic approach across all planning efforts and will use their standing to integrate the mitigation strategy outlined in the 2023 Bossier Hazard Mitigation Plan into other planning documents when appropriate. Most notably, Bossier Parish is in the process of updating their Master Plan and will incorporate the mitigation strategy from this FEMA approved hazard mitigation plan into the Master Plan process and document.

During the planning process for new and updated local planning documents at the parish and jurisdiction level, such as a risk assessment, comprehensive plan, capital improvements plan, or emergency operations plan, the jurisdictions will provide a copy of the Parish Hazard Mitigation Plan to the appropriate parties and recommend that all goals and strategies of new and updated local planning documents are consistent with and support the goals of the Parish Hazard Mitigation Plan and will not contribute to increased hazards.

Although it is recognized that there are many possible benefits to integrating components of this plan into other parish and jurisdiction planning mechanisms, the development and maintenance of this stand-alone Hazard Mitigation Plan is deemed by the planning committee to be the most effective and appropriate method to ensure implementation of Parish and local hazard mitigation actions.

On behalf of the Town of Benton, the City of Bossier City, the Town of Haughton, the Town of Plain Dealing and Unincorporated Bossier Parish has the authority to incorporate the contents of the Hazard Mitigation Plan into the parish's existing regulatory mechanisms. Agreements are currently in place with jurisdictions to allow for the parish incorporation mechanisms to take place.

The following parish and local plans incorporate requirements of this HMP Update as follows through planning committee member and jurisdiction representation throughout the planning process as described above:

Bossier Parish			
<i>Comprehensive Master Plan</i>	Updated as needed	Bossier Parish Police Jury	✓
<i>Capital Improvements Plan</i>	Updated as needed	Bossier Parish Police Jury	✓
<i>Local Emergency Operations Plan</i>	Updated as needed	Bossier Parish OHSEP	✓
<i>Transportation Plan</i>	Updated as needed	Bossier Parish Police Jury	✓
<i>Economic Development Plan</i>	Updated as needed	Bossier Parish Police Jury	✓
<i>Stormwater Management Plan</i>	Updated as needed	Bossier Parish Police Jury	✓
<i>HHPD Emergency Action Plan</i>	Updated as needed	Bossier Parish OHSEP	✓

### Town of Benton

<i>Comprehensive Master Plan</i>	Updated as needed	Town of Benton Mayor's Office	✓
<i>Economic Development Plan</i>	Updated as needed	Town of Benton Mayor's Office	✓
<i>Local Emergency Operations Plan</i>	Updated as needed	Town of Benton Mayor's Office	✓
<i>Continuity of Operations Plan</i>	Updated as needed	Town of Benton Mayor's Office	✓

### City of Bossier City

<i>Comprehensive Master Plan</i>	Updated as needed	City of Bossier City Mayor's Office	✓
<i>Capital Improvements Plan</i>	Updated as needed	City of Bossier City Mayor's Office	✓
<i>Local Emergency Operations Plan</i>	Updated as needed	City of Bossier City Mayor's Office	✓
<i>Transportation Plan</i>	Updated as needed	City of Bossier City Mayor's Office	✓
<i>Stormwater Management Plan</i>	Updated as needed	City of Bossier City Mayor's Office	✓

### Town of Haughton

<i>Local Emergency Operations Plan</i>	Updated as needed	Town of Haughton Mayor's Office	✓
<i>Stormwater Management Plan</i>	Updated as needed	Town of Haughton Mayor's Office	✓

### Town of Plain Dealing

<i>Capital Improvements Plan</i>	Updated as needed	Town of Plain Dealing Mayor's Office	✓
<i>Continuity of Operations</i>	Updated as needed	Town of Plain Dealing Mayor's Office	✓
<i>HHPD Emergency Action Plan</i>	Updated as needed	Town of Plain Dealing Mayor's Office	✓

## Continued Public Participation

Public participation is an integral component of the mitigation planning process and will continue to be essential as this plan evolves over time. Significant changes or amendments to the plan require a public hearing prior to any adoption procedures. Other efforts to involve the public in the maintenance, evaluation, and revision process will be made as necessary. These efforts may include:

- Advertising meetings of the Mitigation Committee in the local newspaper, public bulletin boards, and/or city and county office buildings
- Designating willing and voluntary citizens and private sector representatives as official members of the Mitigation Committee
- Utilizing local media to update the public of any maintenance and/or periodic review activities taking place
- Utilizing city and Parish web sites to advertise any maintenance and/or periodic review activities taking place
- Keeping copies of the plan in appropriate public locations.

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## Appendix C: Critical Facilities

### Critical Facilities within Bossier Parish

Bossier Parish Planning Area Critical Facilities										
Type	Name	Dam Failure	Drought	Flooding	Levee Failure	Thunderstorms	Tornadoes	Tropical Cyclones	Wildfires	Winter Weather
Civil Government	Benton Public Works		x			x	x	x	x	x
	Benton Town Hall		x			x	x	x	x	x
	Bossier Parish OHSEP		x			x	x	x		x
	Bossier Parish Police Jury/Courthouse		x			x	x	x	x	x
	Bossier Parish School Board		x			x	x	x		x
	Caddo-Bossier OHSEP		x			x	x	x		x
	City Hall of Bossier City		x			x	x	x		x
	Haughton Public Works		x			x	x	x	x	x
	Haughton Town Hall		x			x	x	x	x	x
	Plain Dealing Town Hall		x			x	x	x		x
Fire & SAR	Benton Fire District #4, Station 1		x			x	x	x	x	x
	Benton Fire District #4, Station 2		x			x	x	x	x	x
	Benton Fire District #4, Station 3		x			x	x	x	x	x
	Benton Fire District #4, Station 4		x			x	x	x		x
	Benton Fire District #4, Station 5		x			x	x	x		x

Benton Fire District #4, Station 6		x				x	x	x		x
Bossier City Fire Department		x				x	x	x		x
Bossier City Fire Department - Station 2		x				x	x	x		x
Bossier City Fire Department - Station 3		x	x			x	x	x		x
Bossier City Fire Department - Station 4		x				x	x	x	x	x
Bossier City Fire Department - Station 5		x				x	x	x		x
Bossier City Fire Department - Station 6		x				x	x	x		x
Bossier City Fire Department - Station 7		x				x	x	x	x	x
Bossier City Fire Department - Station 8		x	x			x	x	x		x
Bossier City Fire Department - Station 9		x	x			x	x	x		x
Bossier Parish Fire District		x				x	x	x		x
Bossier Parish Fire District #7 No. 2		x				x	x	x		x
Bossier Parish Fire District #7 No. 3		x				x	x	x		x
East 80 Fire District #1 - Station 1		x				x	x	x	x	x
East 80 Fire District #1 - Station 3		x				x	x	x		x
East 80 Fire District #1 - Station 4		x				x	x	x	x	x

	East 80 Fire District #1 - Station 5		x			x	x	x	x	x
	East 80 Fire District #1 - Station 6		x	x		x	x	x	x	x
	East 80 Fire District #1v - Station 2		x			x	x	x	x	x
	Northeast Bossier Fire District 5 Station No. 4		x			x	x	x		x
	Northwest Bossier Fire District 7		x			x	x	x	x	x
	South Bossier Fire District #2 - Station 1		x			x	x	x	x	x
	South Bossier Fire District #2 - Station 2		x			x	x	x		x
	South Bossier Fire District #2 - Station 3		x			x	x	x	x	x
	South Bossier Fire District #2 - Station 4		x			x	x	x	x	x
	South Bossier Fire District #2 - Station 5		x			x	x	x		x
	South Bossier Fire District #2 - Station 6		x	x		x	x	x		x
<b>Law Enforcement</b>	Bossier Parish Maximum Security Jail		x			x	x	x		x
	Bossier Parish Sheriff Department		x			x	x	x		x
	Benton Police Department		x			x	x	x	x	x
	Bossier Parish Sheriff's Office Substation		x			x	x	x		x
	Haughton Police Department		x			x	x	x	x	x

	Plain Dealing Police Department		x			x	x	x	x	x
	Bossier City Police		x			x	x	x		x
<b>Public Health</b>	Christus Bossier Emergency Hospital		x	x		x	x	x		x
	Cornerstone Hospital		x			x	x	x		x
	NCMC Plain Dealing Medical		x	x		x	x	x	x	x
	Willis-Knighton Bossier Health Center		x	x		x	x	x		x
	Airline High School		x			x	x	x		x
<b>Education</b>	Apollo Elementary		x			x	x	x		x
	Bellaire Elementary		x			x	x	x	x	x
	Benton Elementary School		x			x	x	x	x	x
	Benton High School		x			x	x	x	x	x
	Benton Middle School		x			x	x	x	x	x
	Bossier Elementary		x			x	x	x	x	x
	Bossier Highschool		x			x	x	x		x
	Central Park Elementary		x	x		x	x	x		x
	Charlotte Mitchell (Owned by BPSB)		x			x	x	x		x
	Cope Middle School		x			x	x	x		x
	Curtis Elementary School		x			x	x	x		x
	Elm Grove Elementary School		x	x		x	x	x	x	x
	Elm Grove Middle School		x			x	x	x	x	x

Greenacres Middle School		x	x		x	x	x		x
Haughton Elementary		x			x	x	x	x	x
Haughton High School		x			x	x	x	x	x
Haughton Middle School		x			x	x	x	x	x
Kingston Elementary School		x	x		x	x	x		x
Legacy Elementary School		x			x	x	x		x
Meadowview Elementary		x			x	x	x		x
Parkway High School		x			x	x	x		x
Plain Dealing Academy		x	x		x	x	x	x	x
Plain Dealing High School		x			x	x	x		x
Plantation Park Elementary		x			x	x	x		x
Platt Elementary School		x			x	x	x	x	x
Princeton Elementary School		x			x	x	x	x	x
Rusheon Middle School		x	x		x	x	x		x
RV Kerr Elementary		x			x	x	x		x
Stockwell Place		x			x	x	x	x	x
Sun City Elementary		x			x	x	x	x	x
T.L. Rodes Elementary		x			x	x	x	x	x
W.T. Lewis Elementary		x			x	x	x		x
Waller Elementary School		x			x	x	x		x

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## Appendix D: Plan Adoption

## Bossier Parish

## RESOLUTION

BE IT RESOLVED, by the Bossier Parish Police Jury in regular and legal session on this 15<sup>th</sup> day of November, 2023, that it does hereby officially adopt the 2023 Bossier Parish Multi-Jurisdictional Hazard Mitigation Plan.

The resolution was offered by Mr. Benton, seconded by Mr. Cochran. It was officially adopted on this 15<sup>th</sup> day of November, 2023, with the following votes recorded:

YEAS: Mr. Benton, Mr. Brotherton, Mr. Cochran, Mr. Darby, Mr. Gray, Mr. Jorden, Mr. Marsiglia, Ms. Parks, Mr. Plummer, Mr. Rimmer, Mr. Rodgers, Mr. Salzer

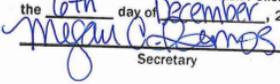
NAYS: None

ABSTAIN: None

ABSENT: None

MEGAN C. RAMOS  
INTERIM PARISH SECRETARY

DOUG RIMMER, PRESIDENT  
BOSSIER PARISH POLICE JURY

This is to certify that this is a true and correct copy of an extract of the minutes of the Bossier Parish Police Jury Meeting held in the Bossier Parish Courthouse in Benton, La. on the 15<sup>th</sup> day of November, 2023. Given under my hand and seal of the Bossier Parish Police Jury on the 16<sup>th</sup> day of December, 2023.  
  
Secretary

## Town of Benton

**RESOLUTION 16 of 2023  
TOWN OF BENTON****A RESOLUTION ADOPTING THE PARISH WIDE HAZARD MITIGATION  
PLAN UPDATE**

WHEREAS, the Town of Benton has participated in the process to update a Disaster Mitigation Act (DMA) compliant Hazard Mitigation Plan based on the FEMA guidance available in the How to Guides; and

WHEREAS the Town of Benton wishes to participate in the Hazard Mitigation Plan Update prepared by the Bossier Parish government under the oversight of a Steering Committee comprised of parish wide representatives; and

WHEREAS the Town of Benton, Bossier Parish, and local representatives have participated in the mitigation planning process; and

WHEREAS appropriate opportunity for input by public and community officials has been provided through press releases, open meetings, and availability of draft documents; and

WHEREAS the updated plan has been recommended for adoption by the Steering Committee; and

WHEREAS adoption of the updated plan is required prior to further consideration for FEMA funding under the following programs:

Pre-Disaster Mitigation (PDM)  
Hazard Mitigation Grant Program (HMGP)  
Flood Mitigation Assistance (FMA) Program

The resolution was offered by Alderman James Friday seconded by Alderman Ron Jones. Upon unanimous vote, it was duly adopted on this 13<sup>th</sup> day of November 2023.

The mayor called for public comments. There being none. Motion carried with the following votes recorded:

YEAS: Alderman Carr, Alderman Manning, Alderman Jones, Alderman Friday, and Alderman Cathcart.

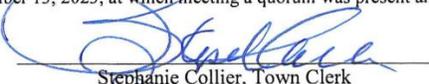
NAYS: None

ABSTAIN: None

ABSENT: None

***CERTIFICATE***

I hereby certify that the foregoing is a true and exact copy of the resolution adopted at the board meeting held on November 13, 2023, at which meeting a quorum was present and voting was recorded.

  
Stephanie Collier, Town Clerk  
November 13, 2023

City of Bossier City

*The following Resolution offered and adopted:*

**RESOLUTION NO. 91 of 2023**

**A RESOLUTION TO ADOPT THE 2023 BOSSIER PARISH MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.**

**WHEREAS**, the 2023 Bossier Parish Multi-Jurisdictional Hazard Mitigation Plan was submitted to the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) and the Federal Emergency Management Agency (FEMA); and,

**WHEREAS**, both GOHSEP and FEMA have granted approval of the submitted plan; and,

**WHEREAS**, a resolution to officially adopt the current plan is required by all participating entities and must be submitted to GOHSEP and FEMA.

**NOW, THEREFORE, BE IT RESOLVED** by the City Council of Bossier City, Louisiana, in regular session convened, does hereby adopt the 2023 Bossier Parish Multi-Jurisdictional Hazard Mitigation Plan; and,

**BE IT FURTHER RESOLVED**, that Mayor Thomas H. Chandler is hereby authorized to sign any and all documents related to this project. Furthermore, Mayor Thomas H. Chandler, representing the City of Bossier City, is hereby given the power and authority to do all things necessary to implement, maintain, amend, and renew such documents relative to the 2023 Bossier Parish Multi-Jurisdictional Hazard Mitigation Plan.

The above and foregoing Resolution was discussed and opened for public input at open and legal session convened, was on motion of Mr. David Montgomery, Jr. and seconded by Mr. Chris Smith and adopted on this the 21st of November, 2023.

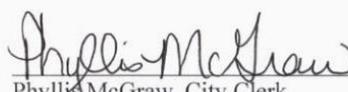
AYES: Mr. Montgomery, Jr., Mr. Smith, Mr. Hammons, Mr. Darby, Mr. Williams, Mr. Free and Mr. Maggio

NAYS: none

ABSENT: none

ABSTAIN: none

  
\_\_\_\_\_  
Jeff Free, President

  
\_\_\_\_\_  
Phyllis McGraw, City Clerk

## Town of Haughton

## TOWN OF HAUGHTON

RESOLUTION 13 OF 2023

A RESOLUTION THAT ACCEPT THE TOWN OF HAUGHTON UPDATED BOSSIER MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR 2023.

WHEREAS the TOWN OF HAUGHTON recognizes the threat that natural hazards pose to people and property within HAUGHTON COMMUNITY; and

WHEREAS the TOWN OF HAUGHTON has prepared a multi-hazard mitigation plan, hereby known as BOSSIER MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS BOSSIER MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in HAUGHTON COMMUNITY from the impacts of future hazards and disasters; and

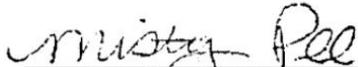
WHEREAS adoption by the TOWN OF HAUGHTON demonstrates their commitment to the hazard mitigation and achieving the goals outlined in the BOSSIER MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF ALDERMEN OF THE TOWN OF HAUGHTON, LOUISIANA, TO ADOPT THE BOSSIER PARISH MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF 2023.

Upon motion by Phillip Smith ,duly seconded by Doug Adams

and carried, the foregoing Resolution adopted by the Town of Haughton in regular session convened on November 14, 2023.

Adams	yea 1	nay__
Anderson	yea 1	nay__
McGee	yea 1	nay__
Isom	yea 1	nay__
Smith	yea 1	nay__

  
Misty Pee, Town Clerk

  
K.W. Gaspard, Mayor

## Town of Plain Dealing

RESOLUTION # 12 OF 2023 OF THE BOARD OF ALDERMEN OF  
TOWN OF PLAIN DEALING

On a motion duly made and seconded the following resolution was adopted at a regular called meeting of the Board of Aldermen of the **TOWN OF PLAIN DEALING**, held at 205 W. Palmetto Ave., Plain Dealing, Louisiana 71064, on the 12<sup>th</sup> day of December, 2023, pursuant to due notice according to the law and open to the public, at which meeting all members of the Board of Aldermen were present:

WHEREAS, the 2023 Bossier Parish Multi-Jurisdiction Hazard Mitigation Plan was submitted to the Governor's Office of Homestead Security and Emergency Preparedness (GOHSEP) and the Federal Emergency Management Agency (FEMA); and,

WHEREAS, both GOHSEP and FEMA have granted approval of the submitted plan; and,

WHEREAS, a resolution to officially adopt the current plan is required by all participating entities and must be submitted to GOHSEP and FEMA.

NOW, THEREFORE, BE IT RESOLVED by the Board of Aldermen of Plain Dealing, Louisiana, in regular session convened, does hereby adopt the 2023 Bossier Parish Multi-Jurisdictional Hazard Mitigation Plan; and,

BE IT FURTHER RESOLVED, that Mayor Shavonda Gay is hereby authorized to sign any and all documents related to this project. Furthermore, Mayor Shavonda Gay, representing the Town of Plain Dealing, is hereby given the power and authority to do all things necessary to implement, maintain, amend, and renew such documents relative to the 2023 Bossier Parish Multi-Jurisdiction Hazard Mitigation Plan.

ALDERMAN	AYES	NAYS	ABSENT
Judith McGuffey			X
Jeff Benson	X		
Emily B Jennings	X		
James Cook	X		
Shanithia "Shanita" Gay	X		

**C E R T I F I C A T E**

I, the undersigned, being the duly elected and acting Municipal Clerk of **TOWN OF PLAIN DEALING** hereby certify that the above and foregoing is a true and complete copy of the resolution duly and unanimously adopted by the Board of Aldermen of the **TOWN OF PLAIN DEALING** on December 12, 2023.

I further certify, that according to the minute book of the **TOWN OF PLAIN DEALING** which is in my possession the foregoing resolution has not been revoked, rescinded, or amended, directly or by inference to this date.

Plain Dealing, Bossier Parish, Louisiana, on December 12, 2023.

*Rutland McCaulley*

MUNICIPAL CLERK TOWN OF PLAIN DEALING

Approved By:

*Shavonda Gay*  
Shavonda Gay, Mayor

## Appendix E: State Required Worksheets

During the planning process ([Appendix A: Planning Process](#)), the Hazard Mitigation Plan Update Planning Committee was provided state-required plan update process worksheets to be filled out. The worksheets were presented at the Initial Planning Meeting by SDMI as tools for assisting in the update of the Hazard Mitigation Plan, but also as a state requirement for the update. The plan update worksheets allowed for collection of information such as planning team members, community capabilities, community infrastructure, vulnerable populations and NFIP information. The following pages contain documentation of the state required worksheets.

### Mitigation Planning Team

Bossier Parish Hazard Mitigation Planning Committee		
Name	Title	Agency
Ian Snellgrove	Director OHSEP	Bossier Parish OHSEP
Gene Barattini	Deputy Director OHSEP	Bossier Parish OHSEP
Shelly Horton	Mayor	Town of Benton
Shavonda Gay	Mayor	Town of Plain Dealing
Rolandria McCauley	Town Clerk	Town of Plain Dealing
Kim Gaspard	Mayor	Town of Haughton
Amanda Nottingham	CAO	City of Bossier City
Ben Raushenbach	Engineer	City of Bossier City
Clinton Patrick	Engineer	City of Bossier City
Butch Ford	Parish Administrator	Bossier Parish Police Jury
Eric Hudson	Engineer	Bossier Parish Police Jury
Nguyen Kha	Asst. Engineer	Bossier Parish Police Jury
Matt Redmon	Asst. Engineer	Bossier Parish Police Jury
Jessica Aldridge	Administration	Bossier Parish Police Jury
Monica Grappe	Administration	Bossier Parish Police Jury
Pat Culverhouse	Public Information Officer	Bossier Parish Police Jury
Robert Jump	Deputy Director OHSEP	Caddo Parish OHSEP
Brian Williams	Director OHSEP	Webster Parish OHSEP
Todd Derrick	Regional Coordinator	GOHSEP

## Capability Assessment

### Unincorporated Bossier Parish

Capability Assessment Worksheet - Bossier Parish		
Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.		
Planning and Regulatory		
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.		
Plans	Yes/No	Comments
Comprehensive / Master Plan	Yes	
Capital Improvements Plan	Yes	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	Yes	
Stormwater Management Plan	Yes	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	No	
Building Code, Permitting and Inspections	Yes/No	Comments
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	No	
Fire Department ISO/PIAL rating	No	
Site plan review requirements	Yes	
Land Use Planning and Ordinances	Yes/No	Comments
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	Yes	
Other	No	

Administration and Technical		
Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.		
Administration	Yes/No	Comments
Planning Commission	Yes	
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
Staff	Yes/No	Comments
Chief Building Official	No	
Floodplain Administrator	Yes	
Emergency Manager	Yes	
Community Planner	Yes	
Civil Engineer	Yes	
GIS Coordinator	Yes	
Grant Writer	No	
Other	No	
Technical	Yes/No	Comments
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	
Hazard Data & Information	Yes	
Grant Writing	No	
Hazus Analysis	No	
Other	No	

Financial		
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.		
Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs	No	

Education and Outreach		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	
Natural Disaster or safety related school program	Yes	
Storm Ready certification	Yes	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	Yes	
Other	Yes	

## Town of Benton

<b>Capability Assessment Worksheet - Benton</b>		
Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.		
<b>Planning and Regulatory</b>		
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.		
<b>Plans</b>	<b>Yes/No</b>	<b>Comments</b>
Comprehensive / Master Plan	Yes	
Capital Improvements Plan	No	
Economic Development Plan	Yes	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	Yes	
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	No	
<b>Building Code, Permitting and Inspections</b>	<b>Yes/No</b>	<b>Comments</b>
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	Yes	
Fire Department ISO/PIAL rating	Yes	
Site plan review requirements	Yes	
<b>Land Use Planning and Ordinances</b>	<b>Yes/No</b>	<b>Comments</b>
Zoning Ordinance	Yes	Bossier and Benton MPC
Subdivision Ordinance	Yes	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	No	
Other	No	

Administration and Technical		
Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.		
Administration	Yes/No	Comments
Planning Commission	Yes	Bossier and Benton MPC
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
Staff	Yes/No	Comments
Chief Building Official	Yes	
Floodplain Administrator	Yes	
Emergency Manager	Yes	
Community Planner	Yes	Bossier and Benton MPC
Civil Engineer	Yes	
GIS Coordinator	No	
Grant Writer	Yes	
Other	No	
Technical	Yes/No	Comments
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	
Hazard Data & Information	No	
Grant Writing	Yes	
Hazus Analysis	No	
Other	No	

Financial		
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.		
Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs	Yes	

Education and Outreach		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	No	
Natural Disaster or safety related school program	No	
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other	No	

## City of Bossier City

<b>Capability Assessment Worksheet - Bossier City</b>		
Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.		
<b>Planning and Regulatory</b>		
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.		
<b>Plans</b>	<b>Yes/No</b>	<b>Comments</b>
Comprehensive / Master Plan	Yes	
Capital Improvements Plan	Yes	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	Yes	
Stormwater Management Plan	Yes	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	No	
<b>Building Code, Permitting and Inspections</b>	<b>Yes/No</b>	<b>Comments</b>
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score	Fourth Class	
Fire Department ISO/PIAL rating	1	
Site plan review requirements	Yes	
<b>Land Use Planning and Ordinances</b>	<b>Yes/No</b>	<b>Comments</b>
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	Stormwater
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	Yes	
Other	No	

Administration and Technical		
Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.		
Administration	Yes/No	Comments
Planning Commission	Yes	
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
Staff	Yes/No	Comments
Chief Building Official	Yes	
Floodplain Administrator	Yes	
Emergency Manager	Yes	
Community Planner	Yes	
Civil Engineer	Yes	
GIS Coordinator	Yes	
Grant Writer	Yes	
Other	No	
Technical	Yes/No	Comments
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	
Hazard Data & Information	Yes	
Grant Writing	Yes	
Hazus Analysis	Yes	
Other	No	

<b>Financial</b>		
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.		
<b>Funding Resource</b>	<b>Yes/No</b>	<b>Comments</b>
Capital Improvements project funding	Yes	
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	Yes	Water & Sewer Outside City Limits
Impact fees for new development	Yes	Water & Sewer Outside City Limits
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs	Yes	State Capital Outlay

<b>Education and Outreach</b>		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
<b>Program / Organization</b>	<b>Yes/No</b>	<b>Comments</b>
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	No	
Natural Disaster or safety related school program		
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other	No	

## Town of Haughton

<b>Capability Assessment Worksheet - Haughton</b>		
Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.		
<b>Planning and Regulatory</b>		
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.		
<b>Plans</b>	<b>Yes/No</b>	<b>Comments</b>
Comprehensive / Master Plan	No	
Capital Improvements Plan	No	
Economic Development Plan	No	
Local Emergency Operations Plan	Yes	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan	Yes	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	No	
<b>Building Code, Permitting and Inspections</b>	<b>Yes/No</b>	<b>Comments</b>
Building Code	Yes	
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire Department ISO/PIAL rating	Yes	Rating: 2
Site plan review requirements	Yes	
<b>Land Use Planning and Ordinances</b>	<b>Yes/No</b>	<b>Comments</b>
Zoning Ordinance	Yes	
Subdivision Ordinance	Yes	
Floodplain Ordinance	Yes	
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	Yes	Stormwater
Flood Insurance Rate Maps	Yes	
Acquisition of land for open space and public recreation uses	Yes	
Other	No	

<b>Administration and Technical</b>		
Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.		
<b>Administration</b>	<b>Yes/No</b>	<b>Comments</b>
Planning Commission	Yes	
Mitigation Planning Committee	Yes	Parish
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	
<b>Staff</b>	<b>Yes/No</b>	<b>Comments</b>
Chief Building Official	No	Contract Out
Floodplain Administrator	Yes	Contract Out
Emergency Manager	No	
Community Planner	No	
Civil Engineer	No	Contract Out
GIS Coordinator	Yes	Parish
Grant Writer	No	
Other	Yes	Zoning Administrator
<b>Technical</b>	<b>Yes/No</b>	<b>Comments</b>
Warning Systems / Service (Reverse 911, outdoor warning signals)	Yes	Parish
Hazard Data & Information	Yes	Parish
Grant Writing	No	
Hazus Analysis	No	
Other	No	

Financial		
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.		
Funding Resource	Yes/No	Comments
Capital Improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	Water & Sewer
Impact fees for new development	Yes	Water & Sewer
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	Yes	
Other Funding Programs	No	

Education and Outreach		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	A.C.T.I.O.N.
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	Yes	Haughton Fire Prevention Program
Natural Disaster or safety related school program	Yes	Parish
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	Yes	
Other	No	

## Town of Plain Dealing

Capability Assessment Worksheet - Plain Dealing		
Local mitigation capabilities are existing authorities, polices and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.		
Planning and Regulatory		
Please indicate which of the following plans and regulatory capabilities your jurisdiction has in place.		
Plans	Yes/No	Comments
Comprehensive / Master Plan	No	
Capital Improvements Plan	Yes	Infrastructure repairs
Economic Development Plan	No	
Local Emergency Operations Plan	No	This plan is in the process of being put together
Continuity of Operations Plan	Yes	Emergency generators are in place to continue water/sewer services
Transportation Plan	No	
Stormwater Management Plan	No	
Community Wildfire Protection Plan	No	
Other plans (redevelopment, recovery, coastal zone management)	No	
Building Code, Permitting and Inspections	Yes/No	Comments
Building Code	Yes/State of LA	IBTS provides Third Party Building Code Compliance Services for the Town
Building Code Effectiveness Grading Schedule (BCEGS) Score	Unknown	IBTS
Fire Department ISO/PIAL rating	Yes	rating 4
Site plan review requirements	Yes	IBTS
Land Use Planning and Ordinances	Yes/No	Comments
Zoning Ordinance	No	
Subdivision Ordinance	No	
Floodplain Ordinance	Yes	IBTS provides Third Party Building Code Compliance Services for the Town
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire)	No	
Flood Insurance Rate Maps	Yes	IBTS/Bossier Parish
Acquisition of land for open space and public recreation uses	No	

<b>Administration and Technical</b>		
Identify whether your community has the following administrative and technical capabilities. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, indicate so in your comments.		
<b>Administration</b>	<b>Yes/No</b>	<b>Comments</b>
Planning Commission	No	
Mitigation Planning Committee	No	Bossier Parish
Maintenance programs to reduce risk (tree trimming, clearing drainage systems)	Yes	Provided as needed by Town Employees
<b>Staff</b>	<b>Yes/No</b>	<b>Comments</b>
Chief Building Official	Yes	Mayor
Floodplain Administrator	Yes	Larry Walter, IBTS
Emergency Manager	No	
Community Planner	No	
Civil Engineer	No	
GIS Coordinator	No	
Grant Writer	No	
Other		
<b>Technical</b>	<b>Yes/No</b>	<b>Comments</b>
Warning Systems / Service (Reverse 911, outdoor warning signals)	No	Outdoor Warning Signal (not operational)
Hazard Data & Information	No	
Grant Writing	No	
Hazus Analysis	No	
Other	No	

Financial		
Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.		
Funding Resource	Yes/No	Comments
Capital Improvements project funding	No	
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Stormwater Utility Fee	No	
Community Development Block Grant (CDBG)	No	
Other Funding Programs	No	

Education and Outreach		
Identify education and outreach programs and methods, already in place that could be used to implement mitigation activities and communicate hazard-related information.		
Program / Organization	Yes/No	Comments
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (responsible water use, fire safety, household preparedness, environmental education)	No	
Natural Disaster or safety related school program	Yes	Fire Safety Programs at Local Schools
Storm Ready certification	No	
Firewise Communities certification	No	
Public/Private partnership initiatives addressing disaster-related issues	No	
Other	No	

## Building Inventory

Bossier Parish and Jurisdiction Owned Building Information								
Unincorporated Bossier Parish								
Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Consolidated water works	Civil Government	1000 Plant Road, Bossier City, LA 71111	Bossier Parish	32.608206	-93.748962			
BOHSEP	Civil Government	1511 Doctors Drive Bossier City, LA 71111	Bossier Parish	32.53385	-93.71607			
Highway Department	Civil Government	410 Mayfield Benton, LA 71006	Bossier Parish	32.4204	-93.4443			
Highway Department - South	Civil Government	134 Crown Court, Bossier City, LA 71112	Bossier Parish	32.43761	-93.5933			
Courthouse	Civil Government	204 Burt Blvd Benton, LA 71006	Bossier Parish	32.67994	-93.74397			
Courthouse Annex	Civil Government	200 Burt Blvd Benton, LA 71006	Bossier Parish	32.67985	-93.74172			
Bossier Parish Maintenance	Civil Government	125 Burt Blvd Benton, LA 71006	Bossier Parish	32.68008	-93.74135			
Bossier Parish Communications	Civil Government	4601 Palmetto Rd, Benton, La 71006	Bossier Parish	32.650467	-93.71237			
Bossier Parish Communications -Tower	Civil Government	609 Cycle Plant Rd, Benton, La 71006	Bossier Parish	32.746458	-93.642356			
Fleet Services	Civil Government	7075 Hwy 3, Benton, La 71006	Bossier Parish	32.723784	-93.737386			
Pistol Range	Civil Government	2977 Old Plain Dealing, La 71064	Bossier Parish	32.8334048	-93.7484588			
Old Maintenance Facility	Civil Government	210 Bossier Street, Benton, La 71006	Bossier Parish	32.696112	-93.738914			
Elm Grove Elementary School	Education	1541 Old Highway 71	Elm Grove	32.35129218	-93.55390676			
Princeton Elementary School	Education	1895 Winfield Road	Princeton	32.58754199	-93.53402207			
Charlotte Mitchell (Owned by BPSB)	Education	1518 Cox St., Bossier City, La 71111	Bossier Parish	32.5210656	-93.7224392			
Plain Dealing Academy	Education	200 Garrett St., Plain Dealing, La 71064	Bossier Parish					
Benton Fire District #4, Station 1	Fire Search and Rescue	306 Fifth Street, Benton, LA 71006	Bossier Parish	32.69774	-93.73798			

Benton Fire District #4, Station 2	Fire Search and Rescue	807 Parks Road, Benton, LA 71006	Bossier Parish	32.65192	-93.67061			
Benton Fire District #4, Station 3	Fire Search and Rescue	5295 Swan Lake Road, Bossier City, LA 71111	Bossier Parish	31.61513	-93.71116			
Benton Fire District #4, Station 4	Fire Search and Rescue	14634 HWY 157, Benton, LA 71006	Bossier Parish	32.70839	-93.57611			
Benton Fire District #4, Station 5	Fire Search and Rescue	651 HWY 160, Benton, LA 71006	Bossier Parish	32.78973	-93.71725			
Benton Fire District #4, Station 6	Fire Search and Rescue	1039 Seven Pines Road, Benton, LA 71006	Bossier Parish	32.77422	-93.64887			
Benton Fire District #4, Training Center	Fire Search and Rescue	150 Fireman's Trail, Benton, LA 71006	Bossier Parish	32.69959	-93.74506			
Benton Fire District #4, Admin	Fire Search and Rescue	5275 Swan Lake Road, Bossier City, LA 71111	Bossier Parish	32.61491	-93.71047			
East 80 Fire District #1	Fire Search and Rescue	Station 1, 4494 US-80, Haughton, LA 71037	Bossier Parish	32.55542	-93.57446			
East 80 Fire District #1	Fire Search and Rescue	Station 1, 4494 US-80, Haughton, LA 71037	Bossier Parish	32.55542	-93.97432			
East 80 Fire District #1	Fire Search and Rescue	Station 2, 115 W. Fire Station Rd, Haughton, LA 71037	Bossier Parish	32.56679	-93.60922			
East 80 Fire District #1	Fire Search and Rescue	Station 3, 3645 Bellevue Rd, Haughton, LA 71037	Bossier Parish	32.62251	-93.56964			
East 80 Fire District #1	Fire Search and Rescue	Station 4, 13333 Hwy 157, Haughton, LA 71037	Bossier Parish	32.67137	-93.52449			
East 80 Fire District #1	Fire Search and Rescue	Station 5, 9346 Hwy 157, Haughton, LA 71037	Bossier Parish	32.56439	-93.51475			
East 80 Fire District #1	Fire Search and Rescue	Station 6, 1501 Oliver Rd, Haughton, LA 71037	Bossier Parish	32.49793	-93.47344			
South Bossier Fire District #2	Fire Search and Rescue	Station 1, 3551 Highway 527 Elm Grove, La 71051	Bossier Parish	32.4237646	-93.5138377			
South Bossier Fire District #2	Fire Search and Rescue	Station 2, 1325 Robinson Rd Elm Grove, La 71051	Bossier Parish	32.3604702	-93.4756148			
South Bossier Fire District #2	Fire Search and Rescue	Station 3, 1094 CC Sandidge Elm Grove, La 71051	Bossier Parish					
South Bossier Fire District #2	Fire Search and Rescue	Station 4, 2452 Sligo Rd Haughton, La 71037	Bossier Parish	32.449357	-93.5773488			
South Bossier Fire District #2	Fire Search and Rescue	Station 5, 8688 Hwy 71 Bossier City, La 71112	Bossier Parish	32.3838918	-93.5937336			
South Bossier Fire District #2	Fire Search and Rescue	Station 5, 13791 Hwy 71 Elm Grove, La 71051	Bossier Parish	32.287069	-93.496011			

Fire District #7, Central Station	Fire Search and Rescue	718 West Palmetto Avenue Plain Dealing LA 71064	Bossier Parish	32.542253	93.423768			
Corrections Command Bldg	Law Enforcement	2983 Old Plain Dealing Rd, Plain Dealing, La 71064	Bossier Parish	32.8381182	-93.7483225			
Community Center	Law Enforcement	2981 Old Plain Dealing Rd, Plain Dealing, La 71064	Bossier Parish	32.8378208	-93.7490306			
Maximum Security jail	Law Enforcement	2985 Old Plain Dealing Rd. Plain Dealing LA 71064	Bossier Parish	32.5022	-93.4451			
Minimum Security Jail	Law Enforcement	2980 Old Plain Dealing Rd. Plain Dealing La 71064	Bossier Parish	32.4959	-93.445			
Teague Substation	Law Enforcement	3135 A.R. Teague Parkway, Bossier City, La 71111	Bossier Parish	32.4927159	-93.6968634			
Viking Drive Substation	Law Enforcement	2510 Viking Drive, Bossier City, La 71111	Bossier Parish	32.5547142	-93.7201525			
Training Academy	Law Enforcement	2981 Old Plain Dealing Rd, Plain Dealing, La 71064	Bossier Parish	32.8376844	-93.7489897			
Criminal Operations Division	Law Enforcement	196 Burt Blvd, Benton, La 71006	Bossier Parish	32.6796494	-93.7409491			
Corrections Maintenance Facility	Law Enforcement	2985 Old Plain Dealing Rd, Plain Dealing, La 71064	Bossier Parish	32.839108	-93.7490223			
Bossier Parish Medium Security Facility	Law Enforcement	2984 Old Plain Dealing Rd, Plain Dealing, La 71064	Bossier Parish	32.8388647	-93.7481575			
Bossier Parish Re Entry Facility	Law Enforcement	181 McCauley Rd., Plain Dealing, La 71064	Bossier Parish	32.8437389	-93.7529504			
Health Unit	Public Health	3022 Old Minden Road Bossier City, 71112	Bossier Parish	32.3116	-93.4133			
<b>Town of Benton</b>								
Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Benton High School	Education	562 HWY 162	Benton	32.66594204	-93.74657933			Metal
Benton Elementary School	Education	301 COLQUITT ST	Benton	32.69573693	-93.71990611			
Benton Middle School	Education	6136 HWY 3	Benton	32.66751784	-93.74609697			
Unknown	Education	1715 Palmetto Road	Benton	32.67256348	-93.73233055			
Bossier Parish EMS	Public Health	Nearby: 102 6th Street	Benton	32.69677796	-93.74070984			
Benton Fire District #4 Station	Fire Search and Rescue	306 5th Street	Benton	32.77420268	-93.64887619			
Benton Fire District #4 Station	Fire Search and Rescue	306 5th Street	Benton	32.78976961	-93.71724694			

Benton Fire District #4 Station	Fire Search and Rescue	14634 HWY 157	Benton	32.70837496	-93.57612355			
Benton Fire District #4 Station	Fire Search and Rescue	306 5th Street	Benton	32.69777424	-93.73795458			
Benton Fire District #4 Administration & Training	Fire Search and Rescue	306 5th Street	Benton	32.6981239	-93.73787287			
Benton Fire District #3 Station	Fire Search and Rescue	16038 HWY 157	Benton	32.77306537	-93.55096676			
Benton Fire District #3 Station	Fire Search and Rescue	266 EMMA CEMETERY RD	Benton	32.82626038	-93.52359077			
Benton Police Department	Law Enforcement	106 Sixth St	Benton	32.6969436	-93.7404658			
Bossier Parish Sheriff's Office Substation	Law Enforcement	7076 HWY 3	Benton	32.73137494	-93.73297878			
Bossier Parish Sheriff's Office	Law Enforcement	196 BURT BLVD	Benton	32.67974139	-93.74074523			
Bossier Parish Courthouse	Civil Government	204 Burt Boulevard #3	Benton	32.67989109	-93.74365998			
Bossier Parish Courthouse Annex	Civil Government	204 Burt Boulevard #3	Benton	32.67984129	-93.74172925			
Unknown Warehouse	Civil Government	Courthouse Drive	Benton	32.68005544	-93.74135092			
Bossier Parish School Board	Civil Government	Bossier Parish School Board	Benton	32.69472396	-93.73955667			
Bossier Parish School Board Annex B	Civil Government	School Board Square	Benton	32.69407259	-93.73934846			
Bossier Parish School Board Child Nutrition Program Annex	Civil Government	School Board Square	Benton	32.6938049	-93.73902128			
Bossier Parish School Board Warehouse	Civil Government	200-306 Kelly Street	Benton	32.69374541	-93.7382896			
Bossier Parish School Board Unknown Building	Civil Government	200-306 Kelly Street	Benton	32.69450684	-93.73803976			
Bossier Parish School Board Unknown Building	Civil Government	200-306 Kelly Street	Benton	32.69353478	-93.73781157			
26th Judicial District Public Defender's Office	Civil Government	207 Burt Boulevard	Benton	32.6789239	-93.74413075			
Town of Benton Public Works Department	Civil Government	302 Fifth Street	Benton	32.697562	-93.738555			
Town of Benton Town Hall	Civil Government	105 Sibley Street	Benton	32.69711101	-93.74046321			

Bossier Parish Communications District 1	Civil Government	4601 PALMETTO RD	Benton	32.65048097	-93.71240219			
Bossier Parish Public Works Highway Department	Civil Government	410 Mayfield Street	Benton	32.70075779	-93.74512101			
<b>City of Bossier City</b>								
<b>Name of Building</b>	<b>Purpose of Building</b>	<b>Address</b>	<b>City</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Assessed Value</b>	<b>Date Built</b>	<b>Construction Type</b>
Fire Station 2	Bossier City Fire Station	1101 Waller AVE	Bossier City	32.50913214	-93.70359833	\$525,000	2005	Reinforced Masonry
Fire Station 3	Bossier City Fire Station	2910 Plantation DR	Bossier City	32.54008681	-93.70656545	\$1,300,000	2013	Reinforced Masonry
Fire Station 4	Bossier City Fire Station	1200 Shady Grove DR	Bossier City	32.47926519	-93.67570849	\$900,000	2002	Reinforced Masonry
Fire Station 5	Bossier City Fire Station	971 Swan Lake RD	Bossier City	32.53608909	-93.67105329	\$2,510,000	2011	Reinforced Masonry
Fire Station 6	Bossier City Fire Station	420 Riverside DR	Bossier City	32.51207237	-93.73067614	\$3,134,000	2010	Reinforced Masonry
Fire Station 7	Bossier City Fire Station	5900 Shed RD	Bossier City	32.56141549	-93.64347277	\$450,000	1998	Reinforced Masonry
Fire Station 8	Bossier City Fire Station	2001 River Bend DR	Bossier City	32.44483418	-93.65169969	\$500,000	1997	Reinforced Masonry
Fire Station 9	Bossier City Fire Station	2621 Brownlee RD	Bossier City	32.5759978	-93.71544692	\$450,000		Reinforced Masonry
Bicentennial Park/Community Development	City Park	100 John Wesley BLVD	Bossier City	32.51750735	-93.70730389	\$205,100	1988	Reinforced Masonry
BPAR - Ft. Smith Pool	City Park	700 Bearkat DR	Bossier City	32.51845797	-93.732253	\$270,000	1988	Reinforced Masonry
Field Of Dreams Park	City Park	4716 Hazel Jones RD	Bossier City	32.54767713	-93.67088478	\$65,880	1980	Reinforced Masonry
Mike Woods Community Park	City Park	2200 Dennis ST	Bossier City	32.4834821	-93.65785976	\$915,000	1985	Reinforced Masonry
Mitchell Neighborhood Park	City Park	1514 Cox ST	Bossier City	32.52104721	-93.72218952	\$29,222		Reinforced Masonry
North Bossier Park Tennis Center	City Park	1651 Mondello Way	Bossier City	32.58166754	-93.72610035	\$1,380,000	2010	Reinforced Masonry
Patricia Drive Community Park	City Park	3051 Patricia DR	Bossier City	32.51479503	-93.6912142	\$35,000		Reinforced Masonry

Shady Grove Neighborhood Park	City Park	3949 Wayne AVE	Bossier City	32.48167555	-93.66755668	\$920,000	1975	Reinforced Masonry
Shed Road Neighborhood Park	City Park	4208 Shed RD	Bossier City	32.54200724	-93.68309467	\$698,000	2015	Reinforced Masonry
Clifford Allman Community Park	City Park	4801 Swan Lake RD	Bossier City	32.54641446	-93.66921517	\$2,112,000	1985	Reinforced Masonry
Tinsley Football Fields	City Park	2250 Tinsley Blvd.	Bossier City			\$468,000	2009	Concrete
Walbrook Park	City Park	2400 Shed RD	Bossier City	32.53067333	-93.71564399	\$2,285,000	1989	Reinforced Masonry
Red River Research Station	Education	Nearby: 156-298 Cotton Road	Bossier City	32.42381029	-93.63610068	\$139,530	1983	Reinforced Masonry
Bossier Parish Community College	Education	Nearby: 6220 East Texas Street	Bossier City	32.53877642	-93.64609591	\$6,313,406	2004	Reinforced Masonry
Lighthouse Christian Academy	Education	608 STOCKWELL RD	Bossier City	32.55306951	-93.63316769	\$10,750	1981	Reinforced Masonry
Sylvan Learning Center	Education	4350 VIKING DR	Bossier City	32.55038725	-93.68278407	\$34,130	1987	Reinforced Masonry
Bossier Parish Educational Resource Center	Education	2900 Douglas Drive	Bossier City	32.49159831	-93.68757159	\$81,620	1965	Reinforced Masonry
Rusheon Middle School	Education	2401 Old Minden Road	Bossier City	32.5206348	-93.70478371	\$124,610	1965	Reinforced Masonry
Stockwell Place Elementary	Education	5801 SHED RD	Bossier City	32.56235374	-93.64513207	\$110,444	1977	Reinforced Masonry
Butler School	Education	541 DETROIT ST	Bossier City	32.52406898	-93.72994227	\$35,720	1952	Reinforced Masonry
Legacy Elementary School	Education	4830 SWAN LAKE RD	Bossier City	32.61848102	-93.69613495	\$1,015,880	2008	Reinforced Masonry
Cope Middle School	Education	4814 SHED RD	Bossier City	32.54534802	-93.66658953	\$337,840	1977	Reinforced Masonry
WT Lewis Elementary	Education	4701 MODICA LOTT RD	Bossier City	32.5643642	-93.67828459	\$1,412,210	2008	Reinforced Masonry
Meadowview Elementary	Education	4312 SHED RD	Bossier City	32.54335775	-93.68144482	\$109,613	1980	Reinforced Masonry
Airline High School	Education	2801 AIRLINE DR	Bossier City	32.55357668	-93.71149474	\$1,973,500	1974	Reinforced Masonry
Plantation Park School	Education	2410 PLANTATION DR	Bossier City	32.5406321	-93.71564597	\$174,030	1968	Reinforced Masonry
Green Acres Middle	Education	2220 Airline Drive	Bossier City	32.54218036	-93.70732069	\$504,350	1976	Reinforced Masonry
Bossier Elementary	Education	1000 Traffic Street	Bossier City	32.52244968	-93.73654739	\$243,520	1953	Reinforced Masonry

Charlotte Mitchell Educational Center	Education	415 Monroe Street	Bossier City	32.52396511	-93.72225849	\$30,860	1950	Reinforced Masonry
Providence Classical Academy	Education	4525 Old Brownlee Road	Bossier City	32.58538	-93.72050422	\$922,272	2011	Reinforced Masonry
R.V. Kerr Elementary	Education	1700 AIRLINE DR	Bossier City	32.51834232	-93.6944989	\$60,090	1970	Reinforced Masonry
Waller Elementary	Education	1130 Patricia Drive	Bossier City	32.50892814	-93.69750626	\$58,820	1959	Reinforced Masonry
Parkway High School	Education	2010 Colleen Drive	Bossier City	32.43357117	-93.64467524	\$3,510,140	2009	Reinforced Masonry
Curtis Elementary	Education	5600 Barksdale Boulevard	Bossier City	32.44129108	-93.64907013	\$82,037	1978	Reinforced Masonry
Elm Grove Middle School	Education	4301 PANTHER DR	Bossier City	32.47374512	-93.66864622	\$876,070	1985	Reinforced Masonry
Bellaire Elementary School	Education	1310 BELLAIRE BLVD	Bossier City	32.48583264	-93.67823451	\$169,278	1997	Reinforced Masonry
Central Park Elementary	Education	900 CENTRAL PARK BLVD	Bossier City	32.51027359	-93.71396605	\$38,470	1970	Reinforced Masonry
Northwest Louisiana State School	Education	Bossier City	Bossier City	32.56181222	-93.65359977	\$72,309		Reinforced Masonry
CenturyLink Center Arena	Multi Purpose Arena	2000 CenturyLink Center Drive	Bossier City	32.4650176	-93.6738135	\$67,000,000	2000	Reinforced Masonry
Bossier Arts Council	Municipal Government	630 Barksdale BLVD	Bossier City	32.51554882	-93.73238978	\$223,878		Reinforced Masonry
Bossier Arts Council Creativity Center	Municipal Government	709 Barksdale BLVD	Bossier City	32.51598493	-93.73174413	\$5,880	1960	Reinforced Masonry
Bossier City Building Maintenance	Municipal Government	1503 Hamilton RD	Bossier City	32.53206521	-93.72679619	\$200,000	1968	Reinforced Masonry
Bossier City Fire/Police Training Center	Municipal Government	5850 Shed RD	Bossier City	32.56133577	-93.6441298	\$1,542,000	2012	Reinforced Masonry
Bossier City Recycling Center	Municipal Government	3301 Old Shed RD	Bossier City	32.53435926	-93.688478	\$506,943	1985	Steel
Bossier Council On Aging	Municipal Government	706 Bearkat DR	Bossier City	32.51875793	-93.73166825	\$1,416,771	1982	Reinforced Masonry
Bossier Police Training Center	Municipal Government	1549 E Texas ST	Bossier City	32.52644461	-93.73176432	\$610,000	1996	Reinforced Masonry
Caddo-Bossier OHSEP	Municipal Government	1511 Doctors DR	Bossier City	32.5338179	-93.71066948	\$42,760	1985	Reinforced Masonry
Environmental Control	Municipal Government	3700 Barksdale Blvd.	Bossier City	32.4822414	-93.68314285	\$15,180	1984	Steel
Fire Department Shelter Warehouse	Municipal Government	725 McArthur DR	Bossier City	32.52571791	-93.71901254	\$500		Reinforced Masonry

Central Fire Station	Municipal Government	620 Benton Rd.	Bossier City			\$3,476,697	1985	Reinforced Masonry
Fire Water Rescue Facility	Municipal Government	3133 Arthur Ray Teague PKWY	Bossier City	32.49361716	-93.69672152	\$125,000	2000	Reinforced Masonry
Hooter Park Head Start Center	Municipal Government	1519 Hooter Park DR	Bossier City	32.50601298	-93.68704901	\$50,000	1991	Reinforced Masonry
Northeast Bossier Treatment Plant	Municipal Government	8000 Shed RD	Bossier City	32.56183858	-93.63135932	\$745,000	1986	Reinforced Masonry
Old Kroger Store (closed)	Municipal Government	801 Benton RD	Bossier City	32.52682417	-93.71893539	\$200,381	1976	Reinforced Masonry
Police Narcotics Building	Municipal Government	100 Gibbs ST	Bossier City	32.53191903	-93.72798368	\$10,890		Reinforced Masonry
Public Works	Municipal Government	3223 Old Shed RD	Bossier City	32.53310289	-93.68995087	\$506,943	1985	Reinforced Masonry
Red River Waste Water Treatment Plant	Municipal Government	3512 Barksdale BLVD	Bossier City	32.48379343	-93.68406014	\$600		Reinforced Masonry
Bossier City Municipal Complex	Municipal Government	620 Benton Road	Bossier City	32.5252426	-93.7141402	\$31,095,000	1985	Reinforced Masonry
Bossier City Civic Center	Municipal Government	620 Benton Road	Bossier City	32.5252426	-93.7141402	\$446,580	1985	Reinforced Masonry
Water Tower	Municipal Government	110 Cash Point Rd.	Bossier City	32.6123041	-93.7387517	\$3,000,000		Steel
Water Tower	Municipal Government	1200 Airline Dr.	Bossier City	32.506563	-93.6956389	\$3,000,000		Steel
Central Warehouse	Municipal Government	1375 Hamilton Rd.	Bossier City	32.5307826	-93.7268835	\$200,000		Metal
Water Plant	Municipal Government	1401 Hamilton Rd.	Bossier City	32.5315231	-93.7261806	\$4,000,000		Concrete
Emergency Preparedness	Municipal Government	1511-1 Doctors Drive	Bossier City	32.5338541	-93.71068966	\$270,000		Reinforced Masonry
Reservoir Pumps	Municipal Government	206 West Viking Drive	Bossier City	32.5667381	-93.7467892	\$1,000,000		Steel
Tinsley Soccer Fields	Municipal Government	2291 Tinsley Blvd.	Bossier City	32.5332393	-93.6965247	\$485,000		Reinforced Masonry
Alternative Fuel Station	Municipal Government	2580 East Texas Street	Bossier City	32.5279127	-93.7152834	\$2,525,000		Steel
Alternative Fuel Station Storage Spheres	Municipal Government	2580 East Texas Street	Bossier City	32.5276874	-93.71545	\$115,102		Steel
Tinsley Softball Park	Municipal Government	3201 Old Shed Rd.	Bossier City	32.5339431	-93.6936042	\$1,970,000		Reinforced Masonry
Public Works Complex	Municipal Government	3223 Old Shed Rd.	Bossier City	32.5338888	-93.6899873	\$1,710,000		Reinforced Masonry

Transfer Station	Municipal Government	3225 Old Shed Rd.	Bossier City	32.5334587	-93.6886915	\$670,000		Steel
Red River Wastewater Treatment Plant	Municipal Government	3700 Barksdale Blvd.	Bossier City	32.4829589	-93.6833178	\$52,697,430		Reinforced Masonry
Public records Storage Facility	Municipal Government	3690 Barksdale Blvd.	Bossier City	32.4831275	-93.6825001	\$1,302,570		Steel
North Bossier Park Bathroom/Playground Equipment	Municipal Government	4307 Old Brownlee Rd.	Bossier City	32.5781804	-93.7235624	\$150,000		Reinforced Masonry
Alternative Fuel Station #2	Municipal Government	4520 Barksdale Blvd.	Bossier City	32.4688645	-93.6696432	\$2,525,000		Steel
Alternative Fuel #2 Station Storage Spheres	Municipal Government	4520 Barksdale Blvd.	Bossier City	32.4686403	-93.6695124	\$115,102		Steel
Water Tower	Municipal Government	5298 Barksdale Blvd.	Bossier City	32.4520126	-93.6563606	\$3,000,000		Steel
Water Tower	Municipal Government	5800 Shed Rd.	Bossier City	32.5600166	-93.64393	\$3,000,000		Steel
Police Parking Canopy	Municipal Government	620 Benton Rd.	Bossier City	32.5253419	-93.7120575	\$124,000		Steel
Creativity Center	Municipal Government	707 Barksdale Blvd.	Bossier City	32.5160082	-93.731785	\$200,000		Reinforced Masonry
Old Kroger Grocery Store	Municipal Government	801 Benton Rd.	Bossier City	32.5267271	-93.7190774	\$2,025,000		Reinforced Masonry
Fire Dept. Storage Bldg.	Municipal Government	725 McArthur St.	Bossier City	32.5257198	-93.7190538	\$310,000		Reinforced Masonry
Old Chef Lee Bldg.	Municipal Government	642 Benton Rd.	Bossier City	32.5248282	-93.7164944	\$414,944		Reinforced Masonry
Police Firing Range	Municipal Government	488 Bodcau Dam Rd.	Bossier City			\$903,213		Reinforced Masonry
Walbrook Park Batting Cages	Municipal Government	1100 Mary Ann St.	Bossier City	32.5300834	-93.7148475	\$76,079		Steel
Meadowview Pool House	Municipal Government	4208 Shed Rd.	Bossier City	32.542032	-93.6830536	\$741,940		Reinforced Masonry
112 Lift Stations	Municipal Government	City wide	Bossier City			\$9,143,500		Steel
Parking Garage	Parking Garage	700 Traffic ST	Bossier City	32.51882338	-93.73829489	\$20,000,000	2005	Concrete
<b>Town of Haughton</b>								
Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Haughton Town Hall	Civil Government	118 West McKinley Avenue	Haughton	32.53357447	-93.50574848			

Haughton Municipal Complex	Civil Government	149 South Elm Street	Haughton	32.531086	-93.514534			
Haughton Middle School	Education	Haughton	Haughton	32.52426152	-93.51033701			
Haughton High School	Education	210 East McKinley Avenue	Haughton	32.5343326	-93.50068514			
Haughton Elementary School	Education	395 S Elm Street	Haughton	32.524185	-93.510367			
Haughton Fire Department	Fire Search and Rescue	224 West McKinley Avenue	Haughton	32.53364573	-93.51061993			
Haughton Water Well #1	Fresh Water Supply	123 South Myrtle Street	Haughton	32.530658	-93.503385			
Haughton Water Well #2	Fresh Water Supply	202 North Elm Street	Haughton	32.534825	-93.515639			
Haughton Water Well #3	Fresh Water Supply	434 East McKinley Ave	Haughton	32.535206	-93.489168			
Haughton Water Well #4	Fresh Water Supply	300 Cedar Street	Haughton	32.523346	-93.494091			
Haughton Water Well #5	Fresh Water Supply	300 Lincoln Avenue	Haughton	32.516346	-93.502677			
Haughton Water Well #6	Fresh Water Supply	111 Sligo Industrial Dr.	Haughton	32.463500	-93.512893			
Haughton Water Well #7	Fresh Water Supply	7185 Hwy 157	Haughton	32.501030	-93.510735			
Haughton Water Well #8	Fresh Water Supply	735 Allentown Road	Haughton	32.547137	-93.489861			
Paul Lawrence Home	Historic Site	211 South Elm Street	Haughton	32.528467	-93.513709			
Haughton Police Department	Law Enforcement	120 West McKinley Avenue	Haughton	32.53356689	-93.50618821			
Haughton Public Library	Library	116 West McKinley Avenue	Haughton	32.533603	-93.505535			
Haughton Sewer Lift Station #1	Sewer Lift Station	408 East McKinley Avenue	Haughton	32.535602	-93.493727			
Haughton Sewer Lift Station #2	Sewer Lift Station	300 Lincoln Avenue	Haughton	32.516351	-93.504129			
Haughton Sewer Lift Station #3	Sewer Lift Station	200 North Elm Street	Haughton	32.534514	-93.515338			
Haughton Sewer Lift Station #4	Sewer Lift Station	232 South Foster Drive	Haughton	32.503143	-93.510194			
Haughton Sewer Lift Station #5	Sewer Lift Station	375 West McKinley Avenue	Haughton	32.533036	-93.513178			
Haughton Sewer Lift Station #6	Sewer Lift Station	208 Galilee Street	Haughton	32.526992	-93.495451			
Haughton Sewer Lift Station #7	Sewer Lift Station	492 North Elm Street	Haughton	32.545654	-93.515430			
Haughton Sewer Lift Station #8	Sewer Lift Station	470 East McKinley Avenue	Haughton	32.534995	-93.488428			
Haughton Sewer Lift Station #9	Sewer Lift Station	1235 Camp Street	Haughton	32.536520	-93.533603			
Haughton Sewer Lift Station #10	Sewer Lift Station	248 Owl Lane	Haughton	32.512844	-93.512331			

Haughton Sewer Lift Station #11	Sewer Lift Station	7469 Hwy 157	Haughton	32.509271	-93.512836			
Haughton Sewer Lift Station #12	Sewer Lift Station	590 West McKinley Avenue	Haughton	32.533184	-93.522282			
Haughton Sewer Lift Station #13	Sewer Lift Station	425 Monroe Avenue	Haughton	32.520393	-93.519407			
Haughton Sewer Lift Station #14	Sewer Lift Station	7228 Hwy 157	Haughton	32.502679	-93.510833			
Haughton Sewer Lift Station #15	Sewer Lift Station	352 Mountain Ash Street	Haughton	32.531824	-93.495178			
Haughton Sewer Lift Station #16	Sewer Lift Station	825 West McKinley Ave	Haughton	32.532912	-93.529236			
Haughton Public Works	Utility/Fresh Water Supply	123 South Myrtle Street	Haughton	32.530812	-93.503522			
Haughton Wastewater Treatment Plant	Utility/Sewer	300 Lincoln Avenue	Haughton	32.516061	-93.503251			
Haughton Elevated Tank	Water Supply	123 South Myrtle Street	Haughton	32.530624	-93.503491			

**Town of Plain Dealing**

Name of Building	Purpose of Building	Address	City	Latitude	Longitude	Assessed Value	Date Built	Construction Type
Plain Dealing Municipal Complex	Civil Government	205 West Palmetto Ave	Plain Dealing	32.9052092	-93.70240389	Unknown/Exempt	1979	Reinforced Masonry
Plain Dealing Voting Precinct	Civil Government/Community Center	109 S. Cotton Belt St	Plain Dealing	32.90522289	-93.70345067	Unknown/Exempt	2000	Metal
North Louisiana Criminal Justice Academy	Education	3019 OLD PLAIN DEALING RD	Plain Dealing	32.83757509	-93.74842107			
Senior Center (Meals on Wheels)	Education	600 South Perrin Street	Plain Dealing	32.89750655	-93.69766545			
Plain Dealing High School	Education	300 N PERRIN ST	Plain Dealing	32.91027676	-93.69890073			
Bossier Parish Emergency Medical Services	Emergency Medical Services	Nearby: 305 West Palmetto Avenue	Plain Dealing	32.90517491	-93.70507814			
Bossier Parish Fire District #7 No. 2	Fire Search and Rescue	396 HWY 537	Plain Dealing	32.90657623	-93.79157743			
Bossier Parish Fire District	Fire Search and Rescue	605 KILGORE RD	Plain Dealing	32.92088377	-93.55909203			
Bossier Parish Fire District #7 No. 3	Fire Search and Rescue	120 ABE MARTIN RD	Plain Dealing	32.84528955	-93.71466802			

Northwest Bossier Fire District 7	Fire Search and Rescue	718 W PALMETTO RD	Plain Dealing	32.9062356	-93.71044599			
Northeast Bossier Fire District 5 Station No. 4	Fire Search and Rescue	405-463 Fire Tower Road	Plain Dealing	32.83841839	-93.60235944			
Bossier Parish Sheriff's Office Training Facility	Law Enforcement	200 GARRETT ST	Plain Dealing	32.9142365	-93.70181704			
Plain Dealing Police Department	Law Enforcement	209 West Mary Lee St	Plain Dealing	32.90629811	-93.70244193	Unknown/ Exempt	Unknown	Reinforced Masonry
Bossier Parish Sheriff's Office Range	Law Enforcement	Nearby: 3019 Old Plain Dealing Road	Plain Dealing	32.83667439	-93.75081675			
Bossier Parish Sheriff's Office Rifle Range	Law Enforcement	3006 RIFLE RANGE RD	Plain Dealing	32.83277775	-93.75347882			
Work Release Building	Prisons and Correctional Facilities	181 MCCAULEY RD	Plain Dealing	32.84378924	-93.75151377			
Bossier Medium Security Facility	Prisons and Correctional Facilities	Nearby: 2994-3098 Old Plain Dealing Road	Plain Dealing	32.83887203	-93.74597994			
Bossier Maximum Security Facility	Prisons and Correctional Facilities	Nearby: 2985 Old Plain Dealing Road	Plain Dealing	32.83959025	-93.74829199			
Bossier Minimum Security Facility	Prisons and Correctional Facilities	2960 OLD PLAIN DEALING RD	Plain Dealing	32.83293174	-93.74739321			
NCMC Plain Dealing Medical	Public Health	112 N Forrest St	Plain Dealing	32.90609119	-93.70193084	Unknown/ Exempt	1971/ add 2013	Reinforced Masonry

## Vulnerable Populations

Vulnerable Populations Worksheet					
Bossier Parish					
All Hospitals (Private or Public)	Street	City	Zip Code	Latitude	Longitude
Christus Schumpert Health Plaza	2539 VIKING DR	Bossier City	71111	32.55594483	-93.71483299
Cornerstone Hospital of Bossier City	4900 Medical Drive	Bossier City	71112	32.46069254	-93.66960667
Promise Hospital of Louisiana	2525 VIKING DR	Bossier City	71111	32.55596734	-93.71688361
Red River Behavioral Center	2800 Melrose Avenue	Bossier City	71111	32.54598328	-93.70442121
Spine Center of Excellence	411 Coleman Avenue	Bossier City	71111	32.51847998	-93.73442771
Willis Knighton Medical Center	2105 AIRLINE DR	Bossier City	71111	32.53320488	-93.7075696
Willis Knighton Medical Center (Pavilion)	2449 HOSPITAL DR	Bossier City	71111	32.55837353	-93.71254484
WK Bossier Health Center	2400 Hospital Drive	Bossier City	71111	32.55835888	-93.71829083
NCMC Plain Dealing Medical	112 N Forrest Rd	Plain Dealing	71064	32.90609119	-93.70193084
Nursing Homes (Private or Public)	Street	City	Zip Code	Latitude	Longitude
Brookdale Retirement Community	2540 Benne Blvd	Bossier City	71111	32.5609715	-93.7131764
Northwest Louisiana Veterans Home	3130 Arthur Ray Teague Parkway	Bossier City	71112	32.4920504	-93.6930687
Old Brownlee Community Care Center	4680 Old Brownlee Road	Bossier City	71111	32.5948796	-93.7228321
Pilgrim Manor	1524 DOCTORS DR	Bossier City	71111	32.53588057	-93.70908376
Colonial Oaks	4921 MEDICAL DR	Bossier City	71112	32.46011527	-93.6669042
Northwest Louisiana War Veterans Home	3130 Arthur Ray Teague Parkway	Bossier City	71112	32.49240924	-93.69221682
Horizon Bay Retirement Living	2540 BEENE BLVD	Bossier City	71111	32.56026424	-93.71276381
Pathway Rehabilitation Hospital	4900 Medical Drive	Bossier City	71112	32.46070150	-93.66959140
Heritage Manor of Bossier	2575 Airline Drive	Bossier City	71112	32.54802719	-93.71044664
Cypress Point	2901 Douglas Drive	Bossier City	71111	32.54584501	-93.70453971
Garden Court	4405 Airline Drive	Bossier City	71112	32.57962089	-93.71506702
Old Brownlee Community Care Center	4680 Old Brownlee Road	Bossier City	71112	32.59485449	-93.72173200
Riverview Care Center	4820 MEDICAL DR	Bossier City	71112	32.46268583	-93.66913031
Glenview Gardens	4828 Medical Drive	Bossier City	71112	32.4629937	-93.667891
Heritage Manor	2575 Airline Drive	Bossier City	71111	32.5479643	-93.7104308
Pilgrim Manor	1524 Doctors Drive	Bossier City	71111	32.5356628	-93.7096218
Riverview Care Center	4820 Medical Drive	Bossier City	71112	32.4623586	-93.6676741
Savannah Grand Assisted Living	4770 Brandon Blvd	Bossier City	71111	32.5334994	-93.6685772
The Blake	2000 The Blake Blvd	Bossier City	71111	32.5670405	-93.71040258

Mobile Home Parks	Street	City	Zip Code	Latitude	Longitude
Brunson Mobile Home Park	100 Block Old Plain Dealing Rd	Benton	71006	32.698321	-93.743799
Covington Mobile Home Park	119 Stinson Rd	Benton	71006	32.6908275	-93.7455835
Walker Mobile Home Park	142 Theresa Lane	Benton	71006	32.7609945	-93.772243
Ricardo's Mobile Home Park	6376 Hwy 3	Benton	71006	32.6817083	-93.7471407
Crestwood	Crestwood Circle	Benton	71006	32.68383	-93.75108
Bayou Mobile Estates	5901 E TEXAS ST #67	Bossier City	71111	32.54095216	-93.65424982
Southern Living Mobile Home Park	5303 E TEXAS ST #98	Bossier City	71111	32.53963916	-93.66275306
Pecan Valley Mobile Home Park	6507 BARKSDALE BLVD #224	Bossier City	71112	32.423847	-93.631751
South Bossier Mobile Home Community	1920 Alfred Lane	Bossier City	71112	32.46011082	-93.65812389
Santa Fe Village Mobile Homes	4803 E TEXAS #12	Bossier City	71111	32.53575095	-93.66839334
Pepper Point	6219 East Texas Street # 30	Bossier City	71111	32.543245	-93.651855
Burney's Elm Trailer Park	3700 East Texas Street #24	Bossier City	71111	32.52845963	-93.68653807
Southern Gardens Mobile Home Park	1956 Rossie Lee Drive	Bossier City	71112	32.46361492	-93.65679494
Zack's Mobile Home Park	2326 Barksdale Blvd	Bossier City	71112	32.50757360	-93.70463735
Maplewood	4937 Benton Rd	Bossier City	71111	32.6010139	-93.7377565
Plantation Trace	75 Davidson Drive	Bossier City	71112	32.4521093	-93.659784
Southgate Mobile Home Park	49 Southgate Drive	Bossier City	71112	32.4515609	-93.6604766
Royce Plantation Acres Mobile Home Park	200 Bodcau Loop	Bossier City	71112	32.4460662	-93.5979864
Pecan Valley Mobile Home Park	6507 Barksdale Blvd	Bossier City	71112	32.4239934	-93.6326075
Buford Mobile Home Park	1932 Rossie Lee Drive	Bossier City	71112	32.4626858	-93.6600366
Modica Mobile Home Park	2266 Pine Street	Bossier City	71112	32.0581538	-93.7083351
Modica Mobile Home Park	500 Garden Street	Bossier City	71112	32.5023532	-93.707819
Pepper Point Mobile Home Park	6219 East Texas Street	Bossier City	71111	32.5426094	-93.6560468
Pinecrest Ridge Holdings LLC	1930 Rossie Lee Drive	Bossier City	71112	32.4623048	-93.6612944
South Bossier Mobile Home Park	1920 Alfred Lane	Bossier City	71112	32.4608367	-93.6608984
Southern Gardens Mobile Home Park	1925 Rossie Lee Drive	Bossier City	71112	32.4642445	-93.6623688
BEMA Enterprises LLC	3700 E Texas Street	Bossier City	71111	32.5269329	-93.6877869
Bayou Mobile Estates	5901 E Texas Street	Bossier City	71111	32.5408269	-93.6566133
Southern Living Mobile Home Park	4809 E Texas Street	Bossier City	71111	32.5352876	-93.6698327
Gregorio Mobile Home Park	3810 E Texas Street	Bossier City	71111	32.5284984	-93.6864116
Walker Mobile Home Park	460 Hamilton Road	Bossier City	71111	32.5204115	-93.7274667
Zack's Mobile Home Park	2326 Barksdale Blvd	Bossier City	71112	32.5081251	-93.7071578

Southern Living Mobile Home Park	5303 E Texas Street	Bossier City	71111	32.5394358	-93.6637465
Maplewood Mobile Home Park	452 Maplewood Drive	Bossier City	71111	32.6004192	-93.7380117
Brooks RV Park	4790 Louisiana 154	Elm Grove	71051	32.33502957	-93.44217982
Pine Cove Mobile Home Park	3 Pine Cove Marina Drive	Elm Grove	71051	32.3839906	-93.4456323
Lakeview Circle	315 Lakeview Circle	Elm Grove	71051	32.3319855	-93.4397207
Academy Mobile Home Park	Academy, Marland, Pact (Hwy 157)	Haughton	71037	32.515346	-93.514733
Deer Valley Mobile Home Park	Deer Valley (Hwy 157)	Haughton	71037	32.535859	-93.514648
Foster Mobile Home Park	S. Foster & N. Foster Dr. (Hwy 157)	Haughton	71037	32.503826	-93.510428
Fox Creek Estates	Fox Creek Drive	Haughton	71037	32.531145	-93.511449
Hanson Mobile Home Park	Hanson Creek	Haughton	71037	32.531200	-93.508886
Haughton Estates	Placker Lane	Haughton	71037	32.534059	-93.512491
J's Mobile Home Park	J's Lane	Haughton	71037	32.534907	-93.524862
Thurman Mobile Home Park	S. Thurman & N. Thurman (Hwy 157)	Haughton	71037	32.521335	-93.516139
Woodland Park	368-380 Birchwood Drive	Haughton	71037	32.530642	-93.495185
Hillcrest Mobile Home Park	1 Hillcrest Circle	Haughton	71037	32.5564357	-93.6152182
Oak Haven Place	108 Oak Haven Drive	Haughton	71037	32.5568369	93.5996334
Happy Hills Mobile Home Park	890 Chandler Road	Haughton	71037	32.5491714	-93.5590597
East Highland Mobile Home Park	952 Ferndale Blvd	Haughton	71037	32.5555636	-93.6194754
Green Mobile Home Park	158 Vickers Road	Haughton	71037	32.6466889	-93.5408449
Oak Hill Mobile Home Park	100 Reba Lane	Haughton	71037	32.5511111	-93.6044197
Gran and Poppy's Mobile Home Park	10 Burge Drive	Haughton	71037	32.5349078	-93.5974487
Pine Hill Mobile Home Park	2 Pinehill Circle	Haughton	71037	32.5583316	-93.6177798
Forgey Mobile Home Park	741 Lawrence Drive	Haughton	71037	32.5673179	-93.570797
Peaceful Pines Mobile Home Park	19 Peaceful Pines Drive	Haughton	71037	32.5614414	-93.5241259
Roach Mobile Home Park	651 Chandler Road	Haughton	71037	32.5437022	-93.5601928
Shady Park Mobile Home Park	100 Jodie Drive	Haughton	71037	32.5561602	-93.5781823
Thurman Mobile Home Park	2 North Thurman Street	Haughton	71037	32.5216401	-93.5175898
Todd Mobile Home Park	732 Barransu Drive	Haughton	71037	32.5680833	-93.5698587
Acorn Hill Mobile Home Park	2 Acorn Hill Loop	Haughton	71037	32.4187682	-93.4344185
Whites Mobile Home Park	2 Amanda Lane	Haughton	71037	32.5749206	-93.5717312
Country Roads Mobile Home Park	2600 Horacek Road	Haughton	71037	32.6013917	-93.6031288
Farm Mobile Home Park	101 Windamere	Haughton	71037	32.5553039	-93.5826869
Angelwood LLC	2143 Siglo Road	Haughton	71037	32.4507458	-93.5895509
Hartsell Mobile Home Park	1 Harstell Circle	Plain Dealing	71064	32.9325381	93.7001881

Unknown Trailer Park	42 ACORN HILL LOOP	Princeton	None	32.56325351	-93.5068547
Timberline Village	207 Timberline Lane	Princeton	71067	32.56753471	-93.50672898
Eastwood Park	136 MCSWAIN DR	Princeton	71067	32.56579466	-93.50227011
Pine Creek Estates	215 LAFAYETTE CIR	Princeton	71067	32.560872	-93.547749
Briarwood Holdings LLC	7 Briarwood Lane	Princeton	71067	32.5869737	-93.567849
Pine Creek	1000 Acadian Blvd	Princeton	71067	32.5612969	-93.5510963
Timberline Village Mobile Home Park	100 Timberline Lane	Princeton	71067	32.5655607	-93.5085165
Victory Mobile Home Park	5749 Hwy 80	Princeton	71067	32.5606083	-93.5400225

## National Flood Insurance Program (NFIP)

National Flood Insurance Program (NFIP)					
	Bossier Parish	Benton	Bossier City	Haughton	Plain Dealing
<b>Insurance Summary</b>					
How many NFIP policies are in the community? What is the total premium and coverage?	1610 policies	6 Policies; \$1,108,000 Coverage; \$3,864 Premiums	3,041 policies; \$2,623,869 in premiums; \$767,105,300 in coverage	# of Policies: 40; Total Premiums: \$21,869; Total Coverage: \$9,846,000	# of Policies: 16; Total Premiums: \$15,052; Total Coverage: \$3,211,500
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	576 claims; \$18,613,591 total payments;	No Claim Paid	404; \$4,204,651.94 in paid claims;	# of Paid Claims: 64; Total Amount of Paid Claims: \$2,398,123; # of Substantial Damage: 13	# of paid claims: 12; Total amount of paid claims: \$183,794; Substantial Damage: 2
How many structures are exposed to flood risk with in the community?	at least 1600	8 (Est.)	5,497	62	20ish
Describe any areas of flood risk with limited NFIP policy coverage.		None	N/A	NONE	The downtown area is mostly at risk for flood. Also the areas near Phillips 66 (hwy3@2), Crabapple Lincoln, South Perrin street, Lynch, cotton belt and Gilmer Street.
<b>Staff Resources</b>					
Is the Community FPA or NFIP Coordinator certified?	Assistant Parish Engineer is CFM	No	The Community Floodplain Manager is the City Engineer and is a licensed Professional Engineer in the State of Louisiana. No CFM certification	NO	N/A
Is flood plain management an auxiliary function?	Yes	Yes	No	YES	N/A

Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review, enforcement, some education and outreach, limited GIS, some engineering capability	Engineering & administration handled by the Parish. Permit, plan review, and inspection are performed by a third party.	Through the engineering department and its Floodplain Manager, the City of Bossier City performs NFIP services through the permitting process, GIS mapping, inspections and community involvement through the CRS Program requirements. The permitting review process determines floodplain zoning and determination if a proposed elevation of 1' above the BFE will be required prior to issuing a building permit. A Flood Elevation Certificate is required for both construction documents and after construction is completed.	Permit, Review, inspections, engineering contracted out	N/A
What are the barriers to running an effective NFIP program in the community, if any?	Staff size	Personnel & Funding	Community Involvement / Education	NONE	N/A
<b>Compliance History</b>					
Is the community in good standing with the NFIP?	Yes	Yes	Yes	Yes	Yes
Are there any outstanding compliance issues(i.e., current violations)?	No	No	No	No	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact(CAC)?	2/10/2022	Unknown	2022	CAV: 7/20/2022; CAC: 2/10/2022	<b>CAV:</b> 05/14/2007; <b>CAC:</b> 02/10/2022
Is a CAV or CAC scheduled or needed? If so when?	No	No	No	No	No

Regulation					
When did the community enter the NFIP?		7/26/1977	6/28/1974	E=7/22/1975; R=9/30/1981	E = 03/12/1975; R = 04/15/1981
Are the FIRMs digital or paper?	Both	Both	Digital	Paper	Digital
When did the community adopt the FIRM's	9/19/2013	9/19/2013	9/19/2013	3/26/2009	3/26/2009
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Yes, the Parish used the FEMA model ordinance to develop its ordinance	Yes	FEMA Requirements; City Ordinances require that any development within the floodplain be constructed a minimum of 1' above the BFE.	Meets	Meets
Community Rating System (CRS)					
Does the community participate in CRS?	No	No	Yes	No	No
What is the community's CRS Class Ranking?		Unknown	9	N/A	N/A
Does the plan include CRS planning requirements?		Unknown	Yes		N/A