

1.0 Introduction

In 2012, FEMA revised the crosswalk review process and developed a local mitigation plan review tool. The improved tool is designed to provide constructive recommendations from FEMA on areas that could be explored with future updates to strengthen the community's plan for effective mitigation strategies. MEMA implemented a requirement for jurisdictions to provide the completed local mitigation plan review tool with the draft plans submitted for state review. The completed crosswalk is provided in Appendix 8.1-A.

The Disaster Mitigation Act and the Flood Insurance Reform Act

In an effort to reduce mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) amending the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of DMA 2000 emphasizes the need for state and local government entities to closely coordinate mitigation planning activities and makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for federal mitigation grant funds. These funds include the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program, both of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security.

The Flood Insurance Reform Act of 2004 (P.L. 108-264) created two grant programs, Severe Repetitive Loss (SRL) and Repetitive Flood Claim (RFC), and modified the existing Flood Mitigation Assistance (FMA) program. This act requires completion of a FEMA-approved Hazard Mitigation Plan in order for communities to be eligible for these FEMA mitigation programs. Communities with an adopted and federally-approved hazard mitigation plan thereby become pre-positioned and more apt to receive available mitigation funds before and after the next disaster strikes.

As part of an overall community planning effort, the City of Biloxi in 2002 developed its first Hazard Mitigation/Floodplain Management Plan pursuant to the requirements of DMA 2000. It also incorporates additional planning steps to meet the requirements of the National Flood Insurance Program's Community Rating System (CRS). The Plan was constructed utilizing the four-step mitigation process outlined in the FEMA Local Mitigation Planning Guide to ensure all necessary requirements of the programs were sufficiently met. This process includes:

- 1) Organize Resources
- 2) Assess Hazards and Risks
- 3) Develop a Mitigation Plan
- 4) Implement the Plan and Monitor Progress

1.1 Hazard Mitigation Planning

Hazard mitigation can be defined as the use of short- and long-term strategies that will reduce or eliminate the loss of injuries, life, and property resulting from hazards. A comprehensive mitigation approach addresses hazard vulnerabilities existing today and in the foreseeable future. Implementation strategies include structural changes such as strengthening or protecting buildings and infrastructure from the destructive forces of potential hazards as well as non-structural strategy such as land-use policies and the creation of public awareness programs. It is widely accepted the most effective mitigation measures are implemented at the local level, where decisions on the regulation and control of development are ultimately made. Therefore, it is essential projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease a community's overall hazard vulnerability.

A key component in the formulation of a comprehensive approach to hazard mitigation is to develop, adopt, and update a local hazard mitigation plan. A hazard mitigation plan establishes a broad community vision and guiding principles for reducing hazard risks and further proposes specific mitigation actions to eliminate or reduce identified vulnerabilities.

FEMA Definition of Hazard Mitigation: "Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Mitigation planning and activities provides jurisdictions with a number of benefits such as:

- Reduced loss of life, property, essential services, critical facilities and economic hardship
- Reduced short-term and long-term recovery and reconstruction costs
- Increased cooperation and communication within the community through the planning process
- Increased potential for state and federal funding for recovery and reconstruction projects

Figure 1.1 Understanding Risk



Figure 1.1 illustrates the concepts of risk reduction.

1.2 Purpose

The Biloxi Hazard Mitigation/Floodplain Management Plan is a cooperative and collaborative effort between the City of Biloxi; Harrison County Emergency Management; local, state, federal agencies; citizens and private entities to eliminate or reduce the long-term risk to human life and property from potential hazards. The Plan goes beyond the minimum DMA 2000 requirements of assessing natural hazards, to further identify and discuss mitigation strategies for various technological and civil hazards that pose a threat to the City. Included in the plan are efforts to develop measures to reduce the cost of preparedness, response time and recovery time from hazard incidents.

The purpose of the plan is to document specific natural hazards most probable to occur within the study area, evaluate the anticipated risks and potential damage, and identify feasible and cost-effective pre-disaster actions to reduce risks. The Biloxi Hazard Mitigation/Floodplain Management Plan was developed specifically to achieve the following objectives:

- Protect life and property
- Reduce damage to homes and businesses
- Reduce damage to public infrastructure such as roads, water, sewer, bridges and public buildings
- Increase public safety
- Avoid/minimize economic disruption and losses
- Reduce human suffering
- Protect the environment
- Save taxpayer dollars
- Flood insurance cost reduction
- Maintain the City of Biloxi's eligibility for the following:
 - National Flood Insurance Program
 - FEMA and MEMA Planning Grants
 - Federal/State Funding for Repetitive Loss Buyout Program
 - Retain eligibility for other Federal/State funding

1.3 Priorities

Requirement 201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five years in order to continue to be eligible for mitigation project grant funding.

Even before Hurricane Katrina in 2005, the City of Biloxi was aware of their need to set realistic priorities to protect the lives and properties located within its jurisdiction. Through the leadership of the Mayor, City Council and Department Directors, proactive measures were implemented to communicate preparedness, response time and recovery efforts to residents and business owners.

Through the rebuilding process following Katrina, Biloxi integrated mitigation strategies in their Comprehensive Plan, Land Use and other regulations/ordinances to promote sustainability. The City is also actively communicating to the public through their web page and Email service about opportunities to participate in preparedness initiatives and learn about state and federal programs to further protect their properties and families. The commitment of the City remains a high priority in reducing their vulnerabilities which are articulated throughout this plan update. The hazard identification and risk assessment, mitigation strategies and plan maintenance chapters provide specific information to identify areas of concern and procedures to implement for their continued commitment to reduce or eliminate those vulnerabilities.

1.4 Authority and Adoption

Requirement §201.6(c)(5): [The plan shall include...] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan.

Authority

The City of Biloxi Council initiated development of this Hazard Mitigation/Floodplain Management Plan (“the Plan”). The City applied for and received a grant through the Hazard Mitigation Grant Program (HMGP) to prepare an update to the 2007 Hazard Mitigation/Floodplain Management Plan. The HMGP is sponsored by the Federal Emergency Management Agency (FEMA) and administered by the Mississippi Emergency Management Agency (MEMA). A copy of the grant approval letter is provided in Appendix 8.1-B.

Plan Adoption

A public meeting was held on _____ for citizens to formally review and accept this Plan prior to sending to MEMA and FEMA for state and federal approval. This plan meets the requirements of Section 201.6(c)(5) and was approved by FEMA on _____. The City Council proceeded to adopt this Plan on _____ as demonstrated by the executed Resolution, meeting agenda and FEMA approval letter provided in Appendix 8.1-C.

1.5 Summary of Contents

The Table of Contents was modified slightly from the 2007 plan to improve the flow of data presented and the coordination of the FEMA Crosswalk. Below is a summary of the contents presented in chapters 2 through 7.

Chapter 2: **Community Profile** provides demographic, geographic, and economic characteristics. This information sets the stage for defining the special characteristics useful in understanding the unique vulnerabilities within Biloxi.

Chapter 3: **Planning Process** describes a complete account of the planning committees and public meetings held during the planning process. This section also includes a summary of changes made between the 2007 and 2012 plans.

Chapter 4: **Hazard Mitigation and Risk Assessment** contains five areas of study for each participating jurisdiction: **Risk Assessment, Hazard Identification, Vulnerability Assessment, Estimating Potential Losses, and Analyzing Development Trends**. Historical data is used to identify and prioritize appropriate mitigation actions to reduce/eliminate losses from potential hazards. HAZUS-MH software was also utilized to assist with estimating potential losses from future impacts.

Chapter 5: **Mitigation Strategy** includes the goals and objectives developed to provide a strong foundation for implementing hazard mitigation strategies. Individual **Actions** were identified by goal and objective and include a mitigation group and priority. An **implementation** process is also defined and includes establishment of **priorities. Funding Sources** and Hazard Mitigation Assistance eligibility criteria are also included.

Chapter 6: **Capability Assessment** on the ability of the City to implement strategies and **incorporate mitigation principles into other planning initiatives**. The capabilities of private/public entities and state and federal agencies are also provided.

Chapter 7: **Plan Maintenance** presents the process in which the Biloxi Hazard Mitigation Committee and other identified departments will ensure the Plan is integrated with all other planning documents, regulations, and ordinances and the public is engaged in any and all updates. Procedures are also defined in evaluating the effectiveness of mitigation actions and the status of pending/in process projects.

Page intentionally left blank

DRAFT

2.0 The Planning Process

Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process.

Requirement 201.6(c)(1): The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

According to the Federal Emergency Management Agency (FEMA), any successful planning activity, such as the development of a comprehensive mitigation plan, involves bringing together a cross-section of stakeholders to reach a consensus in achieving a desired outcome or resolve a community problem.

The City of Biloxi supports this initiative through daily interaction with residents, officials and business leaders in local and surrounding communities and participates in various planning initiatives including this hazard mitigation/floodplain management plan. By fostering these relationships, mitigation planning will move closer to achieving its objective of saving lives and reducing future losses resulting from natural disasters.

2.1 Planning Team and Committees

The City of Biloxi solicited qualified Consultants to serve as the Planning Team for updating the 2007 plan with new requirements enacted by FEMA’s revised Local Mitigation Plan Review effective October 1, 2012. Neel-Schaffer, Inc. was selected through the competitive bid process and approved by the City Council as provided in the resolution included in Appendix 8.2-A. Neel-Schaffer selected teaming partner, Witt Associates, to provide Biloxi with a comprehensive team of specialists. Table 2.1 provides the staff members with each firm serving on the Planning Team.

Table 2.1 Planning Team	
 NEEL-SCHAFFER <small>Solutions you can build upon</small>	 WITT <small>ASSOCIATES</small>
Rebecca Boone – Senior Project Manager/Lead Planner	Jacob Halley - Hazard Planner
Steve Twedt, P.E. - Quality Assurance/Quality Control	Brad Donaldson- GIS
Craig High - Community Planner/Stakeholder Involvement	Kelly George – Senior Hazard Planner

The Planning Team was also supported throughout the planning process with technical staff members from the Mississippi Emergency Management Agency (MEMA) as identified in Table 2.2. The Advisory Team provided guidance throughout the planning process ensuring the Biloxi plan met the objectives of the CRF Requirements and the State's mitigation initiatives.

Table 2.2 Technical Advisory Team	
	
Loretta Robinson, MBA – Mitigation Planner	Darla Loftus Jourdan – Grant Specialist
Billy Patrick, CFM – Mitigation Planning Bureau Director	

The 2007 Hazard Mitigation Planning Committee was reviewed and modified to best suit the needs for the 2012 plan update. It was determined to split the previous list of members identified in 2007 into three separate groups – Steering Committee, Mitigation Committee and Stakeholders.

The Steering Committee members identified in Table 2.3 (see Appendix 8-2.A for approval of Committee) was given the responsibility to guide the decision-making process throughout the planning process, assist with the identification of data and needs for inclusion in the plan, appoint members for the mitigation committee, and approve the draft plan prior to submittal to MEMA and FEMA for state and federal review. This Committee will also present the approved plan to the City Council for formal adoption; and, on behalf of the City, assist with integration of the goals and plan maintenance procedures set forth in this plan with other planning initiatives and actions. A sample letter sent to the approved Steering Committee members is provided in Appendix 8-2.B.

**Table 2.3
City of Biloxi Steering Committee**

A. J. Holloway - Mayor of Biloxi	Jerry Creel - Director of Community Development
Sgt. Milton Houseman - Emergency Management/Homeland Security and Chairman of Committee	Rupert Lacy - Harrison County Emergency Management
David Stahling - Director of Administration	Chief David Roberts - Biloxi Fire Department
Richard Sullivan - Director of Public Works	Chief John Miller - Biloxi Police Department
Richard Stickler - Floodplain Manager	

During the first Steering Committee meeting, the appointees named in Table 2.4 were designated to serve on the Mitigation Committee. The role of these individuals is to provide specific data from their departments, identify accomplishments made on the mitigation strategies and actions from the 2007 plan, provide additional actions and recommendations for changes in the mitigation strategies for the 2012 plan, and assist the planning team with draft reviews, ranking of mitigation actions and hazards profiled.

The Mitigation Committee was invited to participate in all planning meetings. Collectively, these two groups will be referred to as the Biloxi Hazard Mitigation Committee throughout the rest of this planning document.

Table 2.4
City of Biloxi Mitigation Committee

Sgt. Milton Houseman – Emergency Manager	Eric Nolan – GIS
Richard Stickler – Floodplain Manager	Kristin Greger – CRS Coordinator
Vincent Creel – Public Relations	John Jennings -
Rupert Lacy – Harrison County EMA Director	Christy LeBatard – Public Works

2.2 Plan Development Meetings

The Biloxi Hazard Mitigation Committee met four times during the planning process to systematically review, prioritize, rank, and identify changes for inclusion in the plan update. Provided below is an agenda of each meetings objectives, dates, times, location, and a brief summary of the results obtained from each meeting. Additional information collected and distributed during the steering and mitigation committee meetings, plus full meeting summaries, are provided in referenced appendix sections.

Meeting 1

Wednesday, July 25, 2012
11:00 a.m. – 2:00 p.m.
City Hall – Council Chambers

Introduction

Plan Update Overview

Hazard Identification and Risk Assessment

Base Map of Biloxi

Quantitative and Qualitative Analyses

Data Needs

Review Hazard Lists

Qualitative Risk Assessment Methodologies

Qualitative Hazard Exercise

Building Ranking Methodology
Mitigation Strategies
Review/Revise Goals and Objectives
Discuss Progress on Mitigation Activities
Mitigation Subcommittee

Schedule

Questions and Dismissal

Meeting Summary

The main objective accomplished during this initial meeting was to review the hazards profiled in the 2007 plan and make determinations of additional hazards for inclusion in the 2012 plan, review of a methodology to rank facilities, and review the goals, objectives and actions for potential changes. The Committee also discussed the asset inventory of the City's facilities and infrastructure and the need for completed information on location and property values. This data will be used to create scenarios of potential loss estimates and identification of additional mitigation strategies reducing future loss/damages to these structures.

As a result of the hazard review, the following were identified as potential threats to the city: fog, hail, high wind, sea level rise, storm surge, and salt water intrusion. In reviewing the building ranking methodology, service stations were moved to Level 3 and casinos were added to Level 4. The steering committee reviewed each goal, objective and action included in the 2007 plan and determined many of the goals could be combined. Several goals and objectives could be restated for a more broad-based approach and a few were identified as no longer feasible for implementation. Appendix 8.2-C contains a full meeting summary, agenda, PowerPoint, and sign in sheet.

Meeting 2

Tuesday, August 14, 2012
1:00 – 4:00 p.m.
Community Development

Introduction

Summary of Hazards Identified by Steering Committee

Mitigation Strategies

Review/revise goals and objectives

Discuss progress on mitigation activities

Assemble list of new mitigation actions

Review Assignments and Schedule

Questions and Dismissal

Meeting Summary

This meeting was conducted as a workshop to freely discuss the accomplishments made on the mitigation actions identified in the plan since 2007, and modify the goals, objectives and actions to a more broad-based approach as directed by the Steering Committee at their first meeting. The group worked from copies of the 2007 plan's Mitigation Strategies section.

The Planning Team collected input and recommendations presented during the workshop for further development into the plan update. The Mitigation Committee was given tasks to provide documentation of completed or in progress projects, property values, locations of facilities, infrastructure and suggestions of new projects that should be considered for the revised plan. The CRS Coordinator also presented a notebook to the Planning Team on the status of RFC properties located within the City for inclusion in the flood section of the 2012 plan. The agenda and sign in sheet are provided in Appendix 8.2-D.

Meeting 3

**Wednesday, September 19, 2012
1:00 – 4:00 p.m.
Community Development**

Hurricane Isaac Impact Discussion
Hazard Identification and Risk Assessment
 Historical Data Review
 Qualitative Risk Assessment Exercise
 Preliminary Building Ranking Discussion
Risk Assessment/Mapping Methodology
 RFC/SRL Map Review
 Data Needs
Mitigation Strategies
 Review Mitigation Sub Committee Recommendations
 Discuss additional Mitigation Objectives/Activities
Public Survey and Public Input Meeting
Questions and Dismissal

Meeting Summary

On the seventh anniversary of Hurricane Katrina, Hurricane Isaac made landfall on the Mississippi Gulf Coast. The City sustained minor damage which was discussed by the Committee to determine how well the completed mitigation strategies prepared the City for this impact. Notes were collected by the Planning Team for inclusion, where applicable, in the plan update.

The Committee walked through the results of the hazard analysis and completed a ranking process to categorize each hazard into a low, moderate or high impact. Results of this data are

provided in Chapter 4. The building ranking methodology was reviewed again making slight modifications.

The Planning Team presented the modified mitigation goals, objectives and actions for review. Comments were compiled through this discussion for inclusion into the mitigation strategies section.

The final order of business for the Committee was determining the date and location for the first public meeting. A decision was made to participate in the City's Festival Against Crime on November 3rd. The Planning Team will provide plan materials and collect public comment during the event. The Planning Team recommended posting a survey on the City's web site to receive additional comments from residents. This was also approved by the Committee. Appendix 8.2-E contains a full meeting summary, agenda, PowerPoint, and sign in sheet.

Meeting 4

**Wednesday, November 14, 2012
2:00 – 5:00 p.m.
Community Development**

Public Survey and Public Input Results
Hazard Identification and Risk Assessment
Mitigation Strategies
Questions and Dismissal

Meeting Summary

The Planning Team relayed the success of the public comment opportunity held during the Biloxi Festival against Crime event. They also provided a summary of the responses received through the online survey which proved to be very successful.

Draft copies of the community profile and mitigation strategies section were provided to the Committee members. Each mitigation action identified to date was reviewed and prioritized individually based on six categories. Detailed information on the methodology used and the results obtained are provided in Chapter 5. The meeting summary, agenda and sign in sheet are provided in Appendix 8.2-F.

Meeting 5

**January 21, 2013
Online Plan Review**

Review Draft Plan

Meeting Summary

The draft plan was sent electronically to members of the Committee allowing time to review the plan within their departments and provide approval/comments prior to the public meeting scheduled for February 28, 2013. The Committee provided comments to the planning team which were incorporated into the draft before submitting to the public for their review.

2.3 Public Involvement

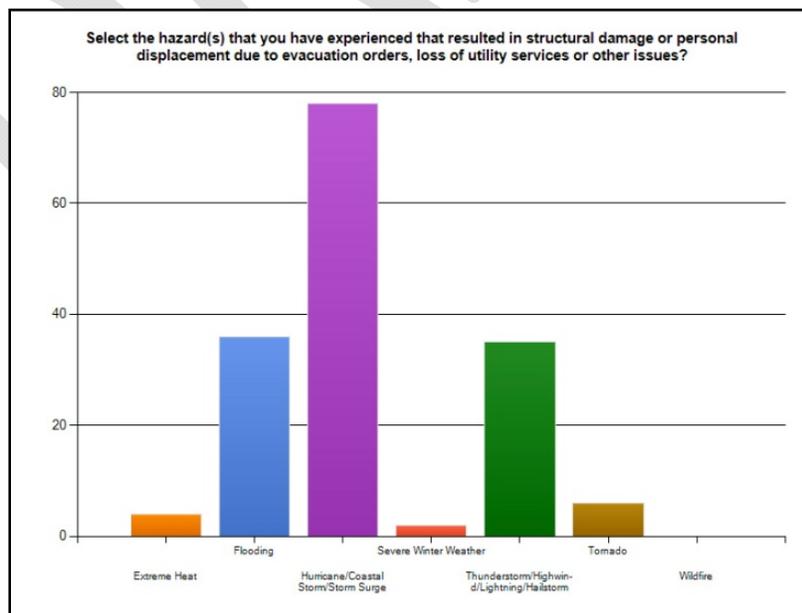
The public engagement process provided an opportunity for persons most affected by hazards to voice their opinions, make suggestions about future mitigation actions, and gain a better understanding of the hazard mitigation challenges and actions. An engaged public is often a key component in building support for the use of financial, technical, and human resources dedicated to preparedness and actions. A variety of public meeting formats were provided - from participation during a City Festival to a come and go format. For those residents who had scheduling conflicts and preferred to communicate electronically, an online questionnaire was used allowing public input on the City's Plan.

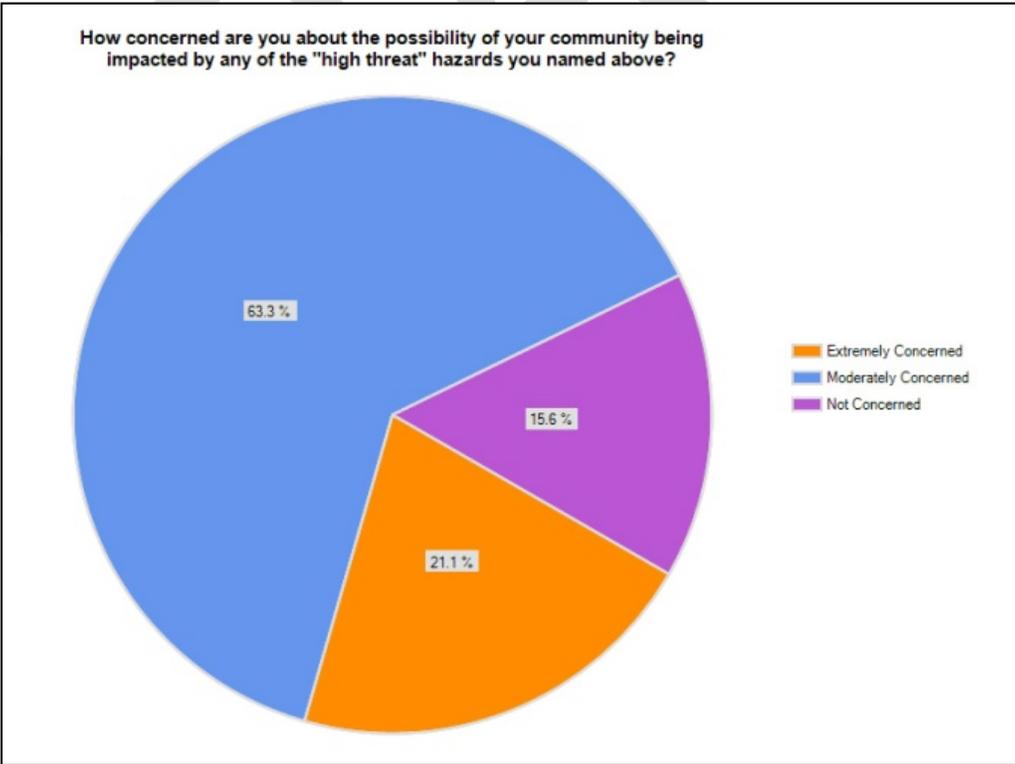
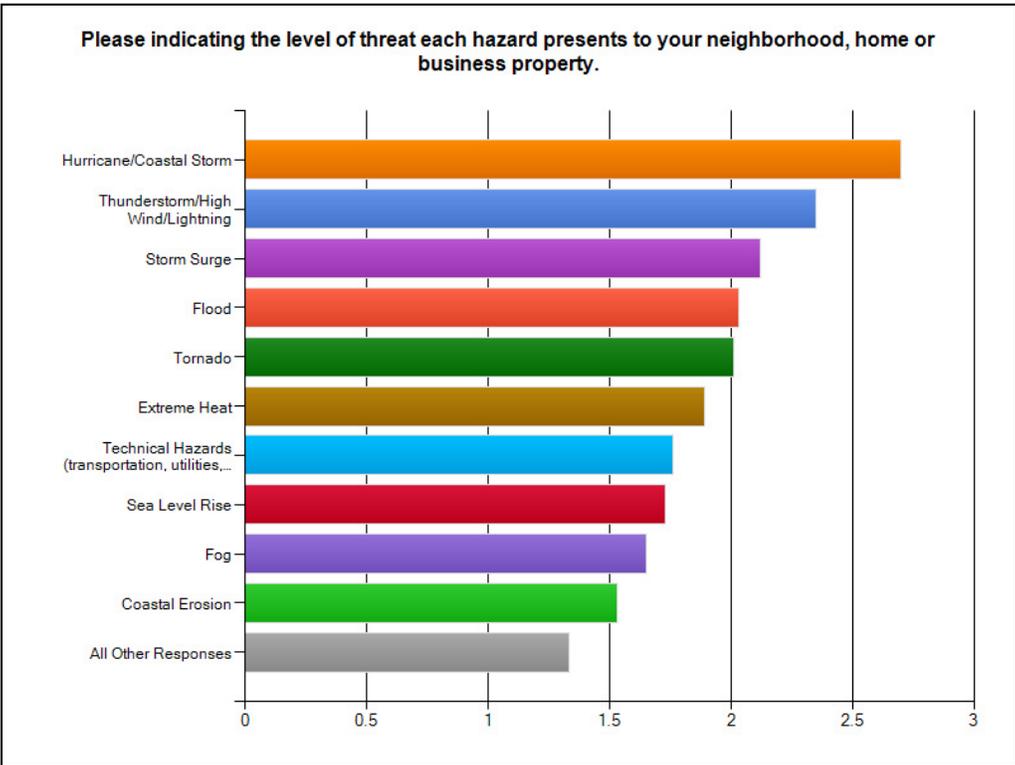


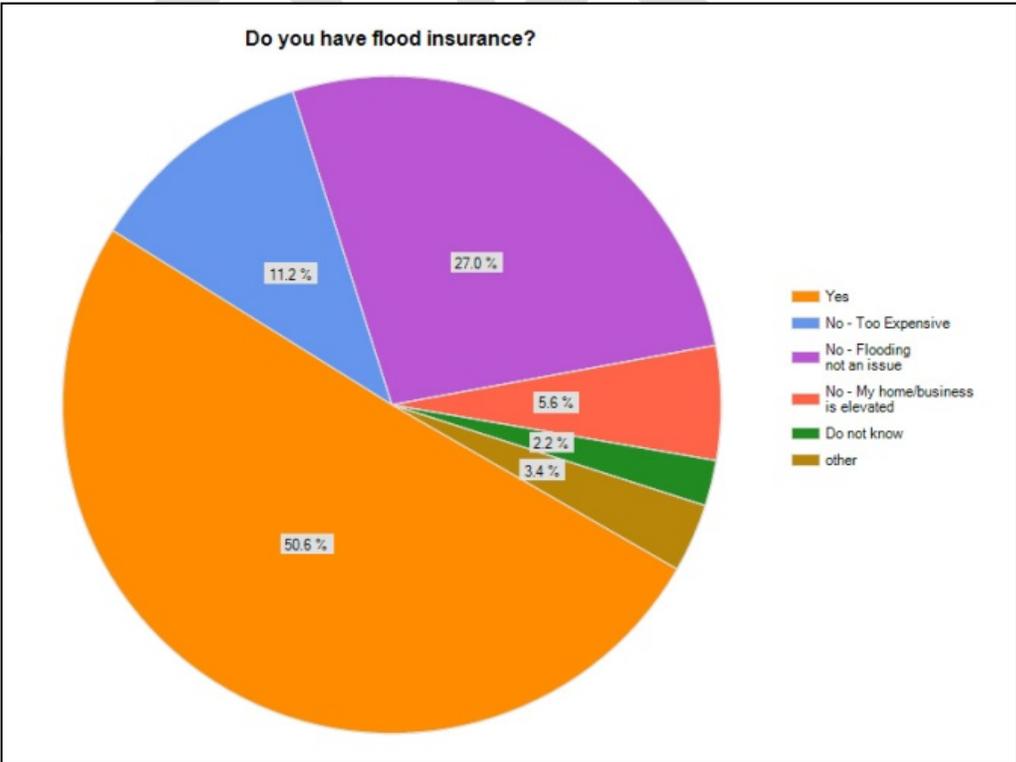
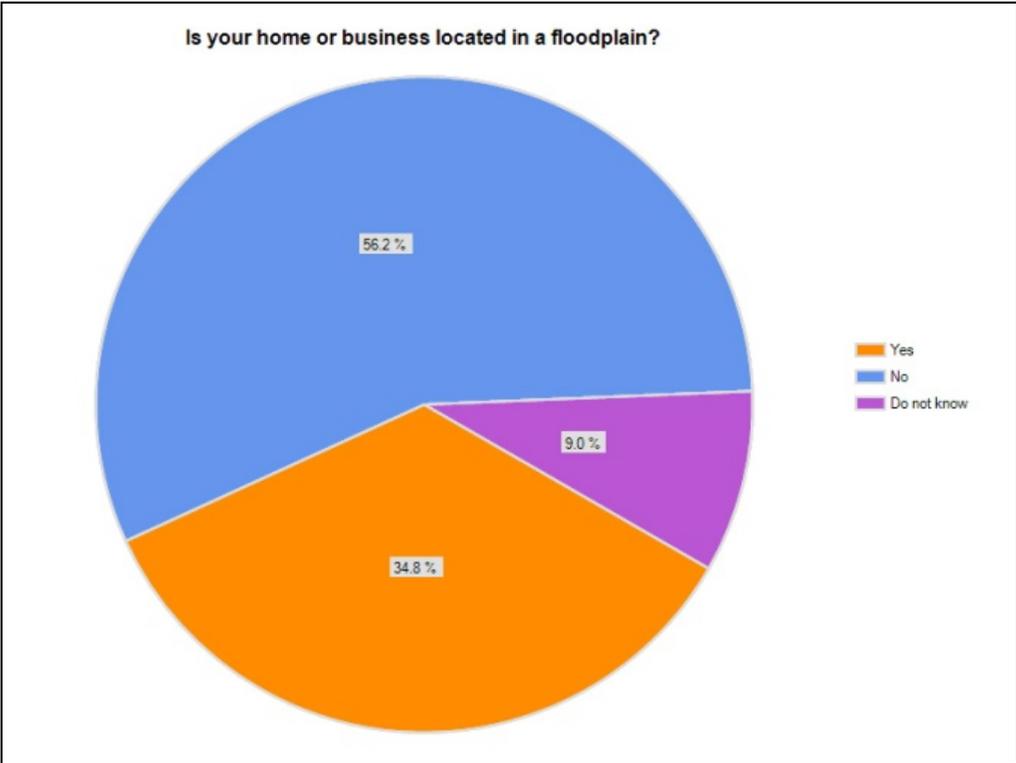
Online Hazard Mitigation Survey

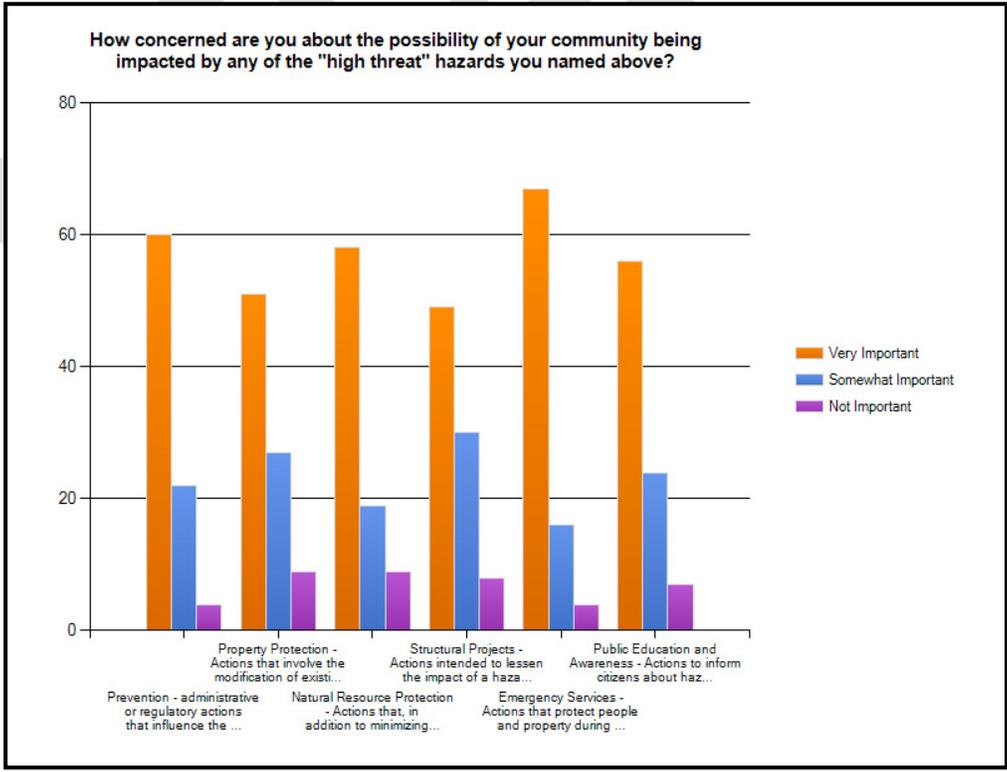
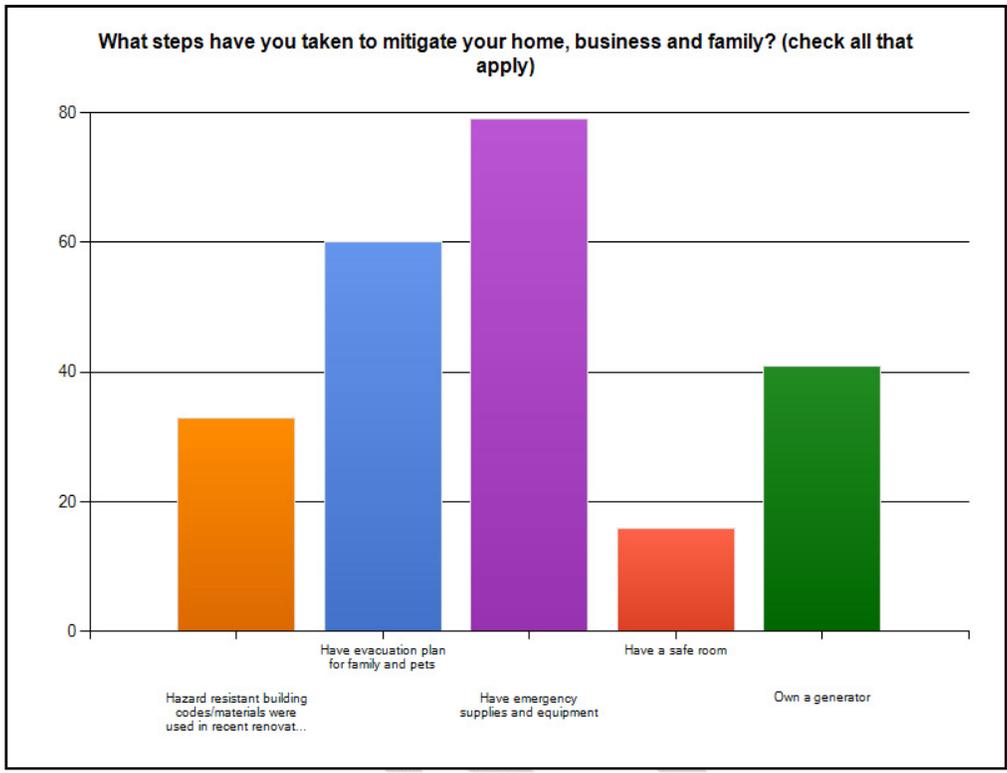
The City of Biloxi Hazard Mitigation Planning Survey was developed through Survey Monkey and linked to the City's web page. The survey provided multi-choice and open-ended questions. The questionnaire consisted of ten questions designed to solicit information about respondent's concerns and experience in dealing with hazards. A copy of the questions and the responses received is provided in Appendix 8.2-G.

The survey was launched on October 24th and concluded on December 6th. During this time a total of 90 residents completed the survey. Of that, 90% were residents of Biloxi and 10% were from Harrison County. Seventy-seven percent feel Biloxi is prepared for natural disasters and 23% did not. The survey was also made available at the *Community Festival Against Crime* event. Below is a summary of the results:









First Public Meeting, November 3, 2012

The first public meeting was held during the City's annual *Community Festival Against Crime* at the Town Green in Biloxi from 12-4:00 p.m. The event was advertised through a variety of methods including a newspaper advertisement, flyers posted on bulletin boards in public buildings and on the City's web page. Letters and e-mails were also sent to all Committee members and Stakeholders. (See Appendix 8.2-H for the public notice, newspaper advertisement, and sign in sheets)

The planning team set up a tent to obtain input from the public attending this event on their thoughts regarding natural and manmade hazards. The public was given several options for providing their input: complete an online survey, use stickers to identify hazards on which they need additional education, complete a comment card describing needs in their neighborhood, or have a personal discussion with the lead planner.

The results of the sticker selection activity indicated the residents are seeking more education on the following hazards: coastal erosion, salt water intrusion. One comment card was received indicating repetitive flooding issues on Cedar Lake Road. Several voiced their stories regarding Hurricane Isaac's recent impact on their area; but for the most part, they felt better prepared for the impacts based on what was learned from Hurricane Katrina. We also heard from residents attempting to participate in the Coastal Retrofit Program, but had issues with their homes qualifying for the approved improvements.

Since the City is also conducting a Climate Change study, it seemed logical to incorporate information on how changes in the environment can impact and further complicate hazards to which the Gulf Coast is prone. Grace Aaron, representing the NOAA sponsored study for Climate Change, was on hand to share information along with the mitigation planning team. These initiatives complement the City's commitment to further their understanding and preparedness for natural hazards.



Literature was available for visitors to take home and share with family and friends. The publications were designed for adults and children. The following guides were provided:

- Mississippi All-Hazards Preparedness Guide – MEMA
- Activity Book – FEMA
- What is Mitigation Planning? – FEMA
- Climate Change – NOAA
- Storm Water Issue – City of Biloxi



The entire event was well received by the public. The Hazard Mitigation tent had 74 visitors sign our registration list with well over 100 visitors stopping by our tent to hear about the City's mitigation plan.

Public/Stakeholder Draft Plan Review Prior to Approval

Second Public Meeting, February 28, 2013–

In order to reach as many citizens and neighboring communities' for participation in the review of the draft Biloxi Hazard Mitigation/Floodplain Management Plan, a public meeting was held on February 28, 2013 in conjunction with the Regional Climate Change Study. A formal presentation was given to the attendees by a guest speaker on the effects of Climate Change to the Mississippi Gulf Coast and a brief overview of the hazard mitigation/floodplain management plan was also delivered. (See Appendix 8.2-J the meeting notification, comments and sign in sheets.)

The meeting was held at the Donal M. Snyder Community Center from 5:30 to 7:30 p.m. with a total of ___ visitors who attended this event and had the opportunity to provide comments on the plan.

The draft plan was also made available electronically with a comment survey on the City's web page from February 11 to February 28, 2013. (See Appendix 8.2-I for web page posting and comments)

The review process was set in accordance with FEMA and MEMA requirements allowing the public an opportunity to review the draft of the Hazard Mitigation/Floodplain Management Plan and offer comments. The purpose of the review was to give the public a chance to review the plan prior to its submittal for approval by MEMA, who in turn will submit it to FEMA for federal approval. The public, members of the Committees, and stakeholder groups (Table 2.5) were notified of the meeting and link for an electronic copy of plan through various communication

methods including the City's *Bmail*, Facebook, Email, US Mail, the City's web page, City buildings and the Donal M. Snyder Community center.

2.4 Coordination with Other Agencies

In an effort to engage key stakeholders during the planning process and participation in public meetings, the following agencies and local businesses were identified as stakeholder members and advised through Email and US mail of public meetings to be held. Additional interviews were conducted with some of these groups, gathering specific information on the capabilities they provide to the City and identification of any mitigation concerns.

American Medical Response	Harrison County School District
American Red Cross	Jackson County Emergency Management Agency
Asian Americans for Change	Keesler Air Force Base
Biloxi City Council	LIFE
Biloxi Harbor Master	Main Street
Biloxi Main Street District	Mississippi Department of Archives and History
Biloxi Public Schools	Mississippi Department of Environmental Quality
Biloxi Regional Medical Center	Mississippi Department of Marine Resources
Center for Environmental and Economic Justice	Mississippi Department of Transportation
CenterPoint Energy	Mississippi Gaming Commission
Chamber of Commerce	Mississippi Highway Patrol
Coastal Transit Authority	Mississippi Insurance Department
CSX Railroad	Mississippi National Guard
Gulf Regional Planning Commission	Mississippi Power Company
Hancock County Emergency Management Agency	Mississippi State Department of Health
Harrison County Emergency Management Agency	STEPS Coalition
Harrison County Health Department	U.S. Coast Guard
Harrison County Sherriff's Department	VA Gulf Coast

2.5 Summary of Changes

The Planning Team and Biloxi Hazard Mitigation Council reviewed each section of the 2007 plan determining the best approach for updating the plan to meet current and future needs of the City. Some chapters were reorganized improving the flow of data. In general, the following changes/enhancements were made:

- Chapter 1 – Introduction was separated from the planning process and enhanced to include a description of the plan, purpose, authority, participation, adoption and summary of the contents.
- Chapter 2 – Planning Process was updated with current data on those involved in the planning process, a summary of the meetings, opportunities for public engagement, and a summary of changes occurring from the previous plan.
- Chapter 3 – Community Profile was enhanced to include climate conditions, land use, housing, and transportation corridors. Statistical information presented in this chapter was updated using the 2010 Census, 2012 Harrison County Development Commission and the 2009 Comprehensive Plan data.
- Chapter 4 – HIRA was enhanced to include more detail on hazards and potential impacts, including support with maps and tables. The Development Trends section was also enhanced to address requirements in the revised Local Plan Review Tool.
- Chapter 5 – Capability Assessment was expanded to include additional coordination of local, state and federal agencies plus existing plan/regulation/ordinance initiatives.
- Chapter 6 – Mitigation Strategy was updated to identify the progress made by the City since the previous plan, enhanced the NFIP program and status of mitigating RFC/SRL properties, identified new actions and other actions no longer relevant for the City, enhanced information presented on the mitigation actions and added a section regarding grant sources.
- Chapter 7 – Plan Maintenance was enhanced to update elements of the plan including mitigation actions, future damages/impacts, incorporation of mitigation strategies into future planning initiatives and continued public involvement. User-friendly forms and processes needed to evaluate, monitor and update the plan going forward are included in the appendix to assist with documentation required for the next plan update.

Page intentionally left blank

DRAFT

3.0 Description of Study Area

The study area for the City of Biloxi's Hazard Mitigation Plan includes the incorporated area of the City as shown in Figure 1. Geographically located in the center of Mississippi's Gulf Coast (Figure 2), Biloxi is 165 miles southwest of Jackson, Mississippi, the state Capital, 75 miles east of New Orleans, Louisiana and 60 miles west of Mobile, Alabama. The incorporated area is 46.5 square miles with 82% land and 18% water according to the 2009 Comprehensive Plan. Biloxi is the county seat of the Second Judicial District of Harrison County, Mississippi. The third largest City in the state, it was selected as one of Money Magazine's "Best Places to Live" and one of the nation's top 15 retirement markets prior to Hurricane Katrina.



Figure 1

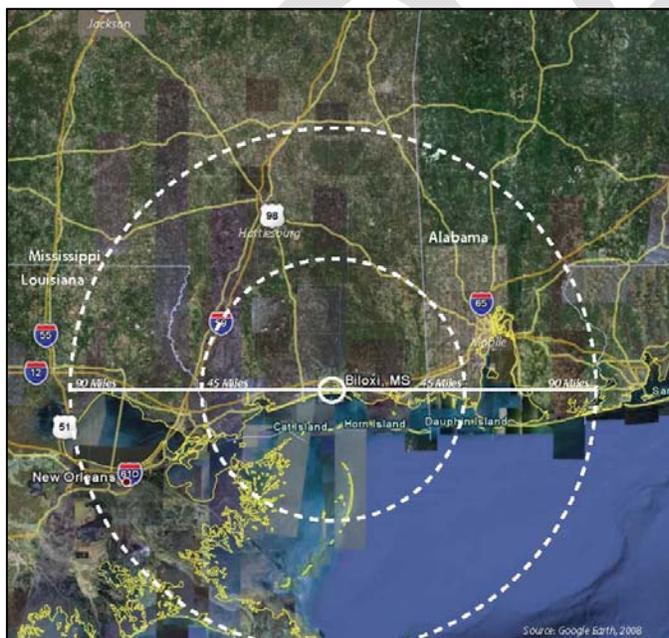


Figure 2

Eight flags have flown over the City, which celebrated its Tricentennial in 1999. Its rich cultural heritage includes French, English and Spanish influences, as reflected in celebrations such as Mardi Gras and the Blessing of the Shrimp Fleet, which honors the local seafood industry. The City is home to the most popular portions of the Mississippi Coast's 26-mile sugar white beach, billed as the nation's longest man-made beach. Other attractions like casino resorts, seafood restaurants, championship golf courses, historic sites, tropical climate and deep sea fishing opportunities make tourism a mainstay of the area's economy.

Water resources include the Mississippi Sound which forms the southern boundary of Harrison County, the Back Bay of Biloxi which separates southern and northern portions of the City, and the Tchoutacabouffa River which empties into the Back Bay. There are several

small islands within these waterways that are owned by the State of Mississippi. However, the City provides services such as police, fire and zoning and land use regulations. Information regarding future development of Deer Island is provided in Chapter 4 – Hazard Identification and Risk Assessment under the Analyzing Development Trends section.

3.1 Climate

Mississippi's subtropical climate is characterized by long, humid summers, moderated in coastal counties by breezes from the Mississippi Sound and the Gulf of Mexico. Winters are short and usually mild. There can be extremes in temperatures particularly in winter and spring, with occasional short periods of freezing temperatures along the coast. Average spring temperatures range from 57 to 77 degrees Fahrenheit; average winter temperatures range from 41 degrees to 62 degrees Fahrenheit. Summer temperatures range from 85 to 95 degrees Fahrenheit, with an average July/August temperature of 91 degrees. Average annual rainfall is between 55 and 64 inches. October is typically the driest month and September the wettest. The prevailing wind direction is typically east-southeast to southeast at 6 to 12 knots. Winds often increase during thunderstorms, which occur frequently and are sometimes accompanied by strong to severe winds, including tornadoes.

The coastal climate is conducive to strong weather events, especially tropical storms and thunderstorms. Coastal surge, flash flooding and river flooding are also a concern to low lying communities located close to major rivers or the Mississippi Sound.

3.2 Population

According to the 2010 Census, the population of Biloxi experienced a 13.0% decrease between 2000 and 2010 with an actual decrease from 50,644 to 44,054 persons. The median age of Biloxi's population is 33.5 years as compared to a median age of 35.3 years for Harrison County. It is significant to note that 5,337 persons or 12.1% of the population in Biloxi are over 65 years of age including 2,496 who are 75 and older. These population groups are highly vulnerable to hazards, particularly incidents, such as hurricanes, involving mass evacuations.

The racial composition of Biloxi is 68.4% White (30,129), 19.6% Black or African-American (8,632) and 4.4% Asian (1,951).

Tables 3.1 to 3.4 present demographic characteristics of Biloxi, Harrison County and other municipalities in the County. (The totals reflected for Harrison County include the municipalities.)

Table No. 3.1
Population Growth, 1950-2010
Harrison County and Municipalities

Year	Harrison County (Total)	Biloxi	D'Iberville	Gulfport	Long Beach	Pass Christian
1950	-	37,425	-	22,659	2,703	3,383
1960	-	44,035	-	30,204	4,770	3,881
1970	134,582	48,486	-	40,791	6,170	4,525
1980	157,665	49,311	-	39,676	7,967	5,014
1990	163,365	46,319	6,566	40,755	15,804	5,557
2000	189,601	50,644	7,608	71,127	17,320	6,579
2010	187,105	44,054	9,486	67,793	14,792	4,613

Source: U.S. Census Bureau, 2010

Table No. 3.2
Population by Age Groups, 2010
Harrison County and Municipalities

Age	Harrison County (Total)	Biloxi	Gulfport	D'Iberville	Long Beach	Pass Christian
0-59 years	155,453	36,617	56,599	6,608	11,866	3,409
60-64 years	9,700	2,100	3,357	343	832	348
65-74 years	12,707	2,841	4,392	427	1,207	482
75-84 years	6,993	1,837	2,598	185	696	269
85 years and over	2,252	659	847	45	191	105
Total Population	187,105	44,054	67,793	7,608	14,792	4,613
Median Age	35.3	33.5	34.3	33.5	39.3	45.9

Source: U.S. Census Bureau, 2010

Table No. 3.3
Racial Composition, 2010
Harrison County and Municipalities

	Total Population	White	% of Total	Black	% of Total	Asian	% of Total
Harrison County (Total)	187,105	130,366	69.7%	41,393	22.1%	5,322	28.0%
Biloxi	44,054	30,129	68.4%	8,632	19.6%	1,951	44.0%
Gulfport	67,793	40,115	59.2%	24,544	36.1%	1,149	1.70%
D'Iberville	7,608	5,950	78.2%	867	11.4%	535	7.00%
Long Beach	14,792	12,642	85.5%	1,224	8.30%	382	2.60%
Pass Christian	4,613	2,964	64.30%	1,285	27.90%	182	3.90%

Source: U. S. Census Bureau , 2010

Table No. 3.4
Land Area and Population Density, 2010
Harrison County and Municipalities

Area	Total Population	Land Area in Square Miles	Persons per square mile
Harrison County (Total)	187,105	573.99	326
Biloxi	44,054	46.5	947.4
D'Iberville	67,793	7.07	1,342.7
Gulfport	7,608	55.59	1,219.5
Long Beach	14,792	10.0	1,478.8
Pass Christian	4,613	15.3	301.50

Source: U. S. Census Bureau, 2010

3.3 Land Use

An existing land use study was completed in 2009 as part of the comprehensive planning process. According to this study, the largest single category of land use was undeveloped land and vacant land and buildings which constituted 28% of the land mass. Undeveloped land was defined as property not previously developed for any use and not currently being used for agriculture and forestry. Most of this land is located north of the Back Bay of Biloxi with scattered areas in west Biloxi. Vacant land and buildings were defined as previously developed properties where buildings were destroyed by Hurricane Katrina. These were primarily located in low-lying areas in east Biloxi and properties closest to waterways and the Mississippi Sound.

Land used for agricultural and forestry purposes constituted the second largest land use category and was primarily located north of Woolmarket Road in the northern portion of the city. Nineteen percent of land use was single-family residential and ten percent institutional and governmental uses with Keesler Air Force Base utilizing most of this land.

Obviously this study does not reflect development occurring in the five year period between 2007 and 2012. Previously undeveloped land was platted for residential development and commercial uses primarily in north Biloxi.

Table No. 3.5
Existing Land Use, 2007

Land Use	Acres	Percentage
Agriculture or Forestry	5,491	23%
Single-Family Residential	4,586	19%
Multi-Family Residential	1,377	6%
Office or Service	322	1%

Table No. 3.5
Existing Land Use, 2007

Land Use	Acres	Percentage
Commercial	476	2%
Casinos and Hotels	290	1%
Institutional or Government	2,546	10%
Industrial or Commercial Seafood	281	1%
Transportation or Utilities	94	.4%
Parks and Recreation	748	3%
Preserved Open Space	1,371	6%
Undeveloped, Vacant Lots, or Vacant Buildings	6,705	28%
Total	24,287	100%

Source: City of Biloxi Comprehensive Plan, 2009

3.4 Housing

According to the 2010 Census, there were 21,278 housing units located within the city limits of Biloxi during this 100% count. This is a decrease of 3.9% or 837 units from the 2000 Census count of 22,115. As is the case with many other coastal cities, most of this decrease can be attributed to structures destroyed or severely damaged by the effects of Hurricane Katrina. Table No. 3.6 gives a breakdown of the number of housing units in all jurisdictions in the county as well as the percentage of units that are single-family detached, single-family attached, two units, three or more units, and mobile homes.

Table No. 3.6
Housing Units (HU) - Harrison County and Municipalities

Area	HU 2000	HU 2010	% One Unit Detached	% One Unit Attached	% Two Units	% Three or More Units	% Mobile Homes	Net Change	% Change
Harrison County	79,636	80,275	64.6	3.10%	2.00%	20.10%	11.80%	639	0.80%
Biloxi	22,115	21,278	55.60%	4.80%	2.40%	28.40%	8.60%	-837	-3.93%
D'Iberville	3,008	3,548	60.60%	1.50%	0.00%	21.20%	16.70%	540	15.22%
Gulfport	29,593	29,619	66.20%	3.70%	2.50%	21.50%	5.70%	26	0.09%
Long Beach	7,203	6,504	77.60%	1.20%	2.50%	15.30%	2.70%	-699	-10.75%
Pass Christian	3,351	2,299	78.10%	2.60%	0.00%	15.70%	2.70%	-1,052	-45.76%

3.5 Economic Data

Biloxi's economy is somewhat diversified with Keesler Air Force Base, casino gaming, tourism, medical, and governmental entities being the mainstays of the economy. The local economy received a boost in 1992 when the City legalized dockside casino gaming. Prior to Hurricane Katrina, Biloxi was well on its way to establishing itself as the South's premier dockside gaming destination, boasting nine casino resorts with more gaming facilities than any other city along the Mississippi Gulf Coast. Although these facilities sustained substantial damage, the Mississippi State Legislature decided to allow gaming on-shore within 800 feet of waterways which has helped revitalize the City's economy. By December 2005, just four months after Hurricane Katrina, three of the City's casinos were back in business. Today, eight of the nine pre-storm casinos are operational. As the City's primary source of revenue and its largest employer, the revitalization of gaming played a significant role in Biloxi's economic recovery.

The City is home to the Mississippi Coast Coliseum and Convention Center, which regularly hosts concerts by world-renowned performers, dozens of trade shows, and conventions. The facility also suffered substantial damages but recently completed a \$68 million expansion which includes an additional 200,000 sq. ft. of flexible meeting and exhibition space.

Keesler Air Force Base is located entirely within the Biloxi City limits. Keesler is the home of the Second Air Force and a major U.S. Air Force computer and electronics training command installation and military medical center. Over 12,000 military and civilian personnel are employed by Keesler, while thousands of military retirees continue to live in the area. Obviously this facility is of vital importance to the City's economic stability. Table No. 3.7 lists the major employers within the City of Biloxi.

Table No. 3.7
Major Employers Biloxi Municipal Area, 2012

Employer	No. of Employees	Product/Service
Keesler Air Force Base	12,222	Military facility
Beau Rivage Casino	2,826	Gaming
Veterans Administration	1,985	Veterans Health care
Imperial Palace Casino	1,842	Gaming
Hard Rock Hotel and Casino	966	Gaming
Grand Casino	1,185	Gaming
The Margaritaville Biloxi Casino and Restaurant	960	Gaming
Grand Biloxi Hotel and Spa	808	Gaming
Palace Casino Resort	763	Gaming
Biloxi Regional Medical Center	750	Healthcare
Isle of Capri Casino	688	Gaming
Biloxi Public School District	655	Education
City of Biloxi	623	Municipal Government
Treasure Bay Casino	591	Gaming
Boomtown Casino	542	Gaming
Yates Construction	250	Construction

Source: Harrison County Development Commission, 2012

3.6 Transportation

The City of Biloxi has several major vehicular transportation routes as well as access to an international airport, commercial railroad service, and small craft sea access to the Mississippi Sound and other local waterways. Local and regional thoroughfares that are accessible to Biloxi and also used for evacuation routes are described below:

East/West Corridors

- Interstate Highway 10 (I-10) is the fourth longest interstate in the United States running 2,460 miles from Los Angeles, California, to Jacksonville, Florida. A segment of this highway transverses Biloxi.
- U. S. Highway 90 runs from Van Horn Texas, to Jacksonville Beach, Florida. For many years this was the primary east-west highway along the coast and continues to serve as a major artery connecting the coastal communities. Highway 90 runs adjacent to the beach.
- Woolmarket Road runs between Cedar Lake and Lorraine Road in north Biloxi.

- Pass Road south of I-10 is a major commercial thoroughfare and runs from Highway 49 in Gulfport and terminates at Rodenberg Avenue at the entrance to Keesler Air Force Base.

North/South Corridors

- Interstate Highway 110 runs from Interstate 10 and terminates on State Highway 90 in downtown Biloxi. This is one of two north/south roads providing a bridge connecting the southern peninsular portion of Biloxi with the northern section of the City. Although most of the length is located in the adjoining City of D'Iberville, it is easily accessible to Biloxi residents.
- MS State Highway 67 (New) runs from Interstate 10 and terminates at Highway 49 at the Harrison and Stone County boundary. Highway 67 becomes Interstate 110 south of I-10. A relatively short distance of this highway is within the City, but is easily accessible to several east/west corridors.
- Popp's Ferry Road runs from Cedar Lake to I-10 exchange. Sections of Popp's Ferry run both east/west and north/south. Popp's Ferry is the second north/south route with a bridge connecting south and north Biloxi.
- Highway 67 (Old Mississippi 67). Several previous routes of Old Highway 67 that are north of I-10 run both north/south and east/west connecting with New 67.
- Hudson-Krohn Road runs north of I-10 and connects with New Highway 67.
- Cedar Lake Road runs south of I-10 and connects with Popp's Ferry Road. Cedar Lake is the only road with an exit off I-10 and is located within the Biloxi incorporated area.

Table No. 3.8 lists major transportation facilities in Biloxi and a map identifying their location is on subsequent pages.

Table No. 3.8
Major Transportation Facilities

Direction/Type of Service or User	Name and Type/Location
Ground Transportation	
East/West	Interstate Highway 10 (I-10) U. S. Highway 90 Pass Road Old Highway 67
North/South	Interstate Highway 110 Popps Ferry Road Cedar Lake/Hudson-Krohn Road New Highway 67
East/West	CSX Transportation Rail Road
Air Transportation	
Public	Gulfport-Biloxi International Airport
Waterways and Ports	
Recreational	Back Bay of Biloxi Tchoutacabouffa River Mississippi Sound
Marinas and Boat Docks	Public Pier and Large Vessel Dock Windjammer Marina Commercial Harbor Biloxi Yacht Club Dock

