

# Developing A More Viable Disaster Housing Unit: A Case Study of the Mississippi Alternative Housing Program



February 2, 2009

*Prepared by:*  
Abt Associates Inc.  
Amy Jones & Associates

*Prepared for:*  
Department of Housing and Urban Development  
Office of Policy Development & Research

Federal Emergency Management Agency  
Disaster Assistance Directorate  
Alternative Housing Pilot Program



# Acknowledgements

This report was prepared by Abt Associates Inc. for the Federal Emergency Management Agency (FEMA) and the U.S. Department of Housing and Urban Development's (HUD) Office of Policy Development and Research (PD&R). FEMA established an interagency agreement with HUD to evaluate the Alternative Housing Pilot Program (AHPP). This case study is the first in a series of evaluation reports and reviews the State of Mississippi's AHPP program from grant start-up in 2007 through August 2008.

The primary authors of this case study are Amy Jones of Amy Jones Associates, Inc. and Erin Wilson of Abt Associates. Dana Bres of PD&R authored Chapter Four, which reviews and summarizes the building sciences evaluation in Mississippi. Larry Buron and Jill Khadduri of Abt Associates provided technical review. The authors are appreciative of the guidance and support provided by Cheryl Levine at HUD and Naomi Johnson at FEMA.

This case study would not have been possible without the willingness of the Mississippi Emergency Management Agency (MEMA) to allow the evaluators access to the inner workings of the Mississippi Alternative Housing Program (MAHP). MEMA's leadership fostered an open, honest atmosphere that encouraged staff with varying project roles to reflect openly on the challenges, successes and lessons learned. In particular, we thank Mike Womack, MEMA's Executive Director, and the MAHP project directors, Becky Baum (MEMA), Keith Campbell (MEMA) and Debbie Norton (PBS&J) for giving generously of their time and experience. The authors also appreciate MEMA's fastidious effort to document program activities and outcomes in order to inform future disaster housing programs.

In addition to MAHP staff, many community leaders and representatives provided valuable context and important perspectives about community needs and the role MAHP is playing in recovery efforts. They gave freely of their time and opinions, despite the heavy demands of the rebuilding effort that continue three years after the storms. Lastly, we thank the MAHP program participants who shared their experiences and thoughts about the program in hopes of contributing to the development of a housing solution that will benefit families in future disasters.



# Table of Contents

## Acknowledgements

<b>Executive Summary .....</b>	<b>1</b>
Introduction .....	1
Grantee Organization .....	2
MAHP Program Design .....	3
Unit Design, Production and Installation .....	4
Disposition and Demobilization of Units .....	6
Observations and Lessons Learned .....	8
The MAHP Units .....	8
Quality of Life .....	11
Community Response .....	13
Organizational Capacity and Implementation .....	14
<b>Chapter One: Introduction .....</b>	<b>17</b>
South Mississippi Before and After Hurricane Katrina .....	17
The Mississippi Alternative Housing Program’s Role in Recovery .....	20
<b>Chapter Two: The Temporary Housing Story .....</b>	<b>27</b>
MAHP’s Vision and Approach .....	27
Manufacturing, Installing and Occupying the Cottages .....	37
Linking Cottages and Families .....	39
<b>Chapter Three: Transitioning to Permanent Housing .....</b>	<b>49</b>
Disposition Planning and Challenges .....	50
The Disposition Plan .....	53
Progress on Special Projects and Disposition Activities .....	63
<b>Chapter Four: Preliminary Results of the Building Sciences Evaluation .....</b>	<b>67</b>
Introduction .....	67
Procurement and Manufacturing .....	70
Development of Accessible (UFAS) Units .....	71
Site Development and Installation .....	71
Ventilation and Air Quality Testing .....	73
Durability .....	73

<b>Chapter Five: Observations and Lessons Learned.....</b>	<b>77</b>
How viable and livable are the MAHP units and how did they affect quality of life for those who lived in them?.....	77
How did the grantee's approach and capacity affect implementation and outcomes?.....	81
How did community stakeholders react to MAHP and to what extent did community response affect program implementation?.....	83
<b>Endnotes .....</b>	<b>87</b>
<b>Attachment 1</b>	
<b>Jurisdiction Maps Showing Distribution of MAHP Units .....</b>	<b>89</b>
<b>Attachment 2</b>	
<b>Program Goals from the MAHP Performance Management Plan .....</b>	<b>105</b>
<b>Attachment 3</b>	
<b>Example Memorandum of Understanding.....</b>	<b>107</b>

# List of Exhibits

Exhibit 1-1: Biloxi, Mississippi: A Biloxi beach after Katrina on September 3, 2005. ....	17
Exhibit 1-2: Damage from Hurricane Katrina .....	18
Exhibit 1-3: MAHP’s Geographical Coverage .....	19
Exhibit 1-4: Damaged Rental Units. ....	20
Exhibit 1-5: Park Model Exterior and Floor Plan.....	21
Exhibit 1-6: The Mississippi Cottage.....	22
Exhibit 1-7: Typical Park Model and Mississippi Cottage Interiors ....	23
Exhibit 1-8: The Eco Cottage.....	24
Exhibit 1-9: Number of MAHP Units Occupied by Month June 2007 to August 2008.....	24
Exhibit 1-10: The Distribution of Occupied MAHP Units Over the Program’s Six-County Geography .....	25
Exhibit 2-1: MAHP’s Operational Sites.....	29
Exhibit 2-2: MAHP Organizational Chart – First Quarter .....	31
Exhibit 2-3: Many Local Governments are Still Operating Out of Temporary Trailers .....	32
Exhibit 2-4: Housing Characteristics Along the Gulf Coast.....	34
Exhibit 2-5: Advisory Base Flood Elevations and the National Flood Insurance Program .....	36
Exhibit 2-6: Aerial View of MAHP Transition Site Near Gulfport, MS... 38	
Exhibit 2-7: Initial “Right-Sizing” Criteria .....	42
Exhibit 2-8: Distribution of MAHP Household Sizes .....	44
Exhibit 3-1: MAHP Organizational Chart June 2008 .....	51
Exhibit 3-2: Elevation Requirements Vary Along the Mississippi Gulf Coast; Elevated Home in Waveland, MS; July 2008.....	54
Exhibit 3-3: Habitat for Humanity of Bay Waveland Worked with a Manufacturer to Design an Addition for Cottages and Park Models.....	56
Exhibit 3-4: Draft Pricing Structure for Cottages.....	59

Exhibit 3-5: A Cottage in a Mobile Home park in Gautier,  
July 2008 .....63

Exhibit 4-1: Number of Units Produced by Each Manufacturer and  
Production Site. ....71



# Executive Summary

## Introduction

In the year following Hurricane Katrina, FEMA deployed more than 12,000 FEMA travel trailers and 9,800 mobile homes to house disaster victims along the Gulf Coast. During this time, it became clear that the breadth and severity of the damage would require a long recovery period and that the trailers were not appropriate long-term temporary housing for displaced households. In June 2006, Congress allocated \$400 million to the Federal Emergency Management Agency (FEMA) to develop alternative designs and prototypes for disaster housing.

FEMA offered the opportunity to apply for Alternative Housing Pilot Program (AHPP) funding to the States of Alabama, Florida, Louisiana, Mississippi and Texas, the five states most severely affected by Hurricanes Katrina, Rita and Wilma. FEMA's particular interest was to identify unit types that would be suitable when a long recovery period is anticipated following a major disaster. Grantees were given significant latitude in both the design of units and how the program would be administered. Three states and one local grantee were awarded funds.

The State of Mississippi received the largest AHPP grant—totaling \$281 million—to develop and install approximately 3,500 units. This Executive Summary highlights key aspects of the State's program and provides the preliminary observations and lessons learned that are discussed in more detail in the full case study that follows.

FEMA contracted with the Department of Housing and Urban Development (HUD) to oversee an evaluation of AHPP implementation and outcomes. The evaluation is composed of two parts. The National Association of Home Builders Research Center, Inc. is tasked with evaluating the units and unit

### AHPP Grantees

Alabama: State of Alabama  
(City of Bayou La Batre)

Louisiana: State of Louisiana  
(Louisiana Housing Finance  
Agency / Louisiana Recovery  
Authority)

Mississippi: State of Mississippi  
(Mississippi Emergency  
Management Agency)

Texas: State of Texas  
(Texas Department of Housing  
and Community Affairs)

installations from a physical (building sciences) standpoint, including the speed and ease of construction and installation, durability, safety and energy efficiency. Abt Associates, Inc. will conduct a “quality of life” evaluation that includes an assessment of the livability of the units as perceived by program participants, the extent to which the units aided participants’ recovery, how the units were perceived by community stakeholders and how the grantee’s organizational capacity and approach affected program and participant outcomes.

The four AHPP projects will be followed through 2010. Two formal surveys of program participants will be conducted over the course of the project to help identify outcomes for participants.

This case study of Mississippi’s program is the first of a number of reports to be produced for the quality of life evaluation. It covers the first 17 months of program implementation for Mississippi, from April 2007 through August 2008. The timing of other evaluation reports will vary depending upon each grantee’s implementation schedule. Case study reports will be prepared for each site as it nears full occupancy. Interim reports will summarize the results of the first follow-up participant survey, and a final report will summarize results of the second participant survey and make cross-site comparisons. Case studies for the remaining three sites will be completed by 2010. The final report will be issued in 2011.

## **Grantee Organization**

The State of Mississippi designated the Mississippi Emergency Management Agency (MEMA) to implement the program known locally as the Mississippi Alternative Housing Program (MAHP). MEMA established a separate MAHP office in Gulfport that is staffed by a combination of local hires, contractor resources and regular State employees who were detailed to the program. The State contracted with Post, Buckley, Schuh & Jernigan, Inc. (PBS&J), a national engineering consulting firm, to provide management and technical support to the project. PBS&J had been involved in the AHPP application process and was at work

on the project before the MEMA management team was fully assembled. At the height of the temporary housing program, about 100 MEMA and contractor staff were working on the program. MAHP's Program Directors report directly to MEMA's Executive Director, and the agency works closely with the Governor's Office of Recovery and Renewal.

## **MAHP Program Design**

MAHP embraced the pilot aspect of the program and committed to simulating the full disaster response cycle, from design through demobilization, within the first two years of the grant. The pilot was designed to test the ability of manufacturers and installers to mobilize quickly and MAHP's organizational capacity to effectively administer an emergency program that gave the State, rather than FEMA, responsibility for the procurement, installation and management of temporary housing. The MAHP proposal called for the temporary housing phase of the pilot to end on March 31, 2009. Although Mississippi proposed a small number of permanent housing sites in the grant application and planned for some units to be converted to permanent housing, MAHP's major focus during the first year of operation was on the temporary program. Key components of the MAHP temporary housing program are described below.

### **Eligible Areas**

MEMA initially offered the program to applicants in the three coastal counties (Hancock, Harrison and Jackson counties) that were most severely affected by the 2005 storms. The program was later expanded into the more rural, inland counties of George, Stone and Pearl River.

### **Eligible Participants**

The MAHP program was open to both homeowners and renters. Participants must have been residents of the affected counties on August 25, 2005, affected by Hurricane Katrina or Rita and, at the time of application, had to still be in need of temporary housing for at least six more months.

## Eligible Sites

In most instances applicants had to provide their own sites and site improvements in order to receive a unit. No group sites were developed under MAHP, but some units were placed in commercial mobile home parks.

## Unit Design, Production and Installation

The State's goal was to design units that could be manufactured and installed quickly for temporary housing, but could also be suitable for long-term occupancy when major disasters resulted in extended recovery periods. The State also wanted to design units that would be credible as permanent housing, if a housing need continued.

Designs for the MAHP units were based on a planning and design process that was completed soon after Hurricane Katrina under the auspices of the Governor's Office of Recovery and Renewal. Ultimately, MAHP elected to produce four unit types. The units were designed to meet both the current HUD code for manufactured housing and the International Residential Code (IRC).

### Key Features of MAHP Units

- ◆ **One-Bedroom Park Model**
  - A direct replacement for FEMA travel trailer
  - 396 square feet
- ◆ **Two- and Three-Bedroom Cottages**
  - 728 and 840 square feet
- ◆ **Handicapped-Accessible Two- and Three-Bedroom Cottages**
  - Compliant with Uniform Federal Accessibility Standards
  - 728 and 840 square feet
- ◆ **Two- and Three-Bedroom Eco-Cottages**
  - Currently in the design phase
  - Intended to have enhanced energy efficient features

The one-bedroom Park Model units are larger than travel trailers and offer significant advantages in terms of structural design and internal layout. Unlike the travel trailers, the Park Model has a separate bedroom and a full-size bathroom and kitchen.

The two- and three-bedroom Cottages are similar in size to mobile homes, but, like the Park model, are greatly enhanced in terms of the quality and durability of materials used and the standards they meet. Just over 20 percent of the two- and three-bedroom Cottages were designed to comply with the Uniform Federal Accessibility Standards (UFAS) to ensure the availability of housing for family members with physical disabilities. All three types of housing were designed with removable undercarriages that would enable them to be placed on permanent foundations.

The Eco-Cottage is a modular unit that is being designed as permanent housing with enhanced energy efficient features. Interior and exterior pictures and floor plans for all four unit types are provided in Chapter One of the full case study.

When the designs were completed, MEMA contracted with six manufacturers of modular housing that produced the units in ten existing factories located in six states. MAHP established a transition site near Gulfport to receive and inspect Cottages and dispatch the units to sites when they were ready. Early quality



Mississippi Cottage Photo: FEMA / Jennifer Smits

control inspections resulted in some refinements to unit specifications. In keeping with efforts to simulate disaster circumstances, MEMA originally installed all Park Models and Cottages in a temporary configuration, on piers and anchored to the ground. Installation specifications called for the units to be able to withstand 150 miles per hour winds. FEMA required that the units be furnished with at least a sofa, dining table and chairs, bed frames and mattresses, as well as a “living kit” that contained linens, dishes, silverware and cleaning supplies.

As of August 28, 2008 Mississippi had installed and occupied 2,806 Park Model and Cottage units. Eco-Cottages were still in the design phase and were expected to be ready for installation before the end of 2008.

## **Disposition and Demobilization of Units**

Considerable interest in using the MAHP units for permanent housing was present from the beginning of the project. However, MAHP made firm commitments to local jurisdictions that the temporary housing program would end and MAHP units would be removed from approved sites no later than March 31, 2009, unless the jurisdictions requested the units remain as temporary housing or approved units for permanent housing. Early in 2008 interest in using the units for permanent housing increased because affordable rental housing was still in short supply and some homeowners had been unable to rebuild their homes.

### **Disposition and Demobilization Options for MAHP Units**

- 1. Sell units to eligible households where permitted by jurisdictions**
- 2. Transfer ownership to community partners for affordable housing**
- 3. Transfer ownership to federal, state or local governments**
- 4. Dispose of units through a public auction**

In April 2008, MAHP began serious planning for the disposition of MAHP units and identified four disposition approaches that were compatible with Mississippi procurement requirements, FEMA's grant agreements and MEMA's commitments to local jurisdictions. MAHP has focused its efforts on the first two options: a sales program to eligible households and the transfer of units to community partners committed to providing affordable rental and homeownership opportunities.



Mississippi Cottages Photo: HUD / October 2008

## Sales to Eligible Households

The sales option is attractive to participants that have an available, eligible site, but is not without challenges. Units placed permanently must be re-installed on a permanent foundation and temporary, above-ground utilities must be converted to underground, permanent connections. In addition, permanent units must comply with elevation requirements established by the National Flood Insurance Program (NFIP). This means that permanent installations are not permitted in some high risk areas and some units must be elevated to meet NFIP requirements.

Financing also is a constraint for many interested program participants. Although MAHP developed a sliding scale pricing structure that is based household income and offers discounts for seniors and households with disabled family members, the combination of mortgage payments, insurance, utilities and

taxes may still exceed what some households can reasonably afford.

## **Transfer to Community Partners**

MAHP has engaged with local government and non-profit partners to develop long-term, affordable rental and homeownership opportunities using MAHP units. Planned projects as of August 2008 include:

- ◆ The South Mississippi Development Corporation (SMDC) will take ownership of more than 300 Park Models and Cottages already located in commercial trailer parks for use with Housing Choice Vouchers. SMDC also plans three new permanent housing developments totaling over 200 units.
- ◆ Habitat for Humanity Bay Waveland will install 44 Cottages as infill housing in Hancock County.
- ◆ Habitat for Humanity Mississippi Gulf Coast, Gulf Coast Community Partners and the City of Pascagoula will install nearly 30 Cottages in Pascagoula.
- ◆ Ocean Springs plans a mixed use development for eight Cottages.

## **Observations and Lessons Learned**

This case study captures MAHP operations as temporary housing activities are winding down and demobilization activities are beginning. Although both the quality of life and the building sciences studies are still underway, it is possible to make preliminary observations and suggest lessons that may be of value to decision-makers for future disaster housing programs.

## **The MAHP Units**

### **Observations**

- ◆ The MAHP program has produced high quality units that exceed both the standards set by HUD for manufactured housing and the requirements of the International Residential Code. Local building officials acknowledged



the quality of units and speculated that the two- and three-bedroom models could have a useful life of as long as 30 years.

- ◆ Although testing is not yet complete, the sturdier materials used in the MAHP units are expected to result in units that are generally more durable than trailers and traditional mobile homes, with greater impact, wind and insect resistance and fewer moisture problems.
- ◆ MAHP's measured approach to unit procurement made it possible to refine unit specifications, create a measure of competition among the manufacturers and manage the flow of units to the transition site. During its peak month, MAHP received and installed more than 400 units. Although a significantly higher volume would be required in a major disaster, this experience suggests that manufacturers of modular housing can quickly mobilize to produce the needed housing.



Park Model Photo: Courtesy of MEMA

## Lessons for the Future

***Technical and quality requirements for units should be established in advance of a disaster.***

MAHP made numerous adjustments to unit designs and installation protocols as a result of problems encountered during

manufacture and delivery. The inevitable clarification and negotiations with the manufacturers about materials, workmanship and aesthetics for a new product were time-consuming. Similarly, lack of clarity about UFAS requirements caused MAHP to discover mid-stream that some of their units did not meet the technical requirements. A uniform design standard that could be shared with housing providers and manufacturers in advance of an emergency could shorten production time and improve the quality of units. The same is true for installation specifications, although adjustments to standard specifications would be needed to accommodate local topographic and soil conditions.

***Unit designs should consider both temporary and more permanent uses.***

None of the MAHP units have sufficient living space to meet the minimum square footage standards required for permanent housing by many Mississippi localities. As a result, a local partner worked with MAHP and one of the manufacturers to design an addition to the Park Models and Cottages. When the scope of a disaster indicates that units may need to serve a longer-term, more permanent use, the selected designs should take into consideration permanent housing standards. However, this must be balanced with the need for units that can be manufactured, transported and installed quickly.

***Emergency housing providers should carefully consider how many different types of units are optimal.***

Developing three different models (Park, Cottage and Eco-Cottage), three bedroom sizes, UFAS-compliant and non-compliant units and units of different colors added complexity to unit tracking and assignments. Some MAHP staff recommended possible ways to reduce the complexity—for example, by designing all units as UFAS accessible or eliminating the smaller Park Model. However, having these options permitted MAHP to better meet participants' needs. Certain options or amenities may be valued differently in other locations and at different stages of disaster response, but the need to strike a balance between variety and efficiency applies in all cases.

***A methodology is needed for determining when enhanced temporary housing units are needed.***

It is not clear how quickly after a disaster an assessment can be made of the length of time temporary housing will be needed or whether some form of modular housing will be needed to support long-term recovery of the housing stock. Developing such a methodology could help Federal and State officials determine when trailers are appropriate and when a larger, more permanent solution is needed.

## **Quality of Life**

### **Observations**

The results of the first formal survey of MAHP participants will not be available until early 2009. Even so, discussions with participants, MEMA staff and contractors, local government representatives and nonprofit organizations can provide a preview of participant perceptions.

- ◆ There appears to be clear consensus that the Park Model and Cottages are a better solution for long-term temporary housing than trailers and even traditional mobile homes. The additional living space, full-size kitchens and bathrooms, more windows and the outside space provided by the porch were reported to contribute substantially to occupants' well being.
- ◆ Improvements to mental health were mentioned by occupants more frequently than improvements to physical health. Living in a unit that "feels more like home" and being able to resume pre-storm activities, such as inviting family and friends over, created a sense of normality that was greatly valued by program participants. Occupants also mentioned feeling more secure in the MAHP units.
- ◆ Accessible features and exterior ramps were major enhancements to participants with mobility impairments, at least one of whom had not been able to leave her temporary trailer under her own power for more than two years.

## Lessons for the Future

### *Right-sizing of units is an important quality of life consideration.*

In its effort to simulate disaster conditions MAHP initially established restrictive occupancy standards, sometimes assigning two-, three-, and four-person households to the one-bedroom Park Model. This standard was changed later in the program when it became apparent that applicants did not have the same tolerance for limited living space that they might have had immediately after the disaster. It is important for future implementers to consider how long the unit is likely to be used before setting occupancy standards.



Mississippi Cottage July 2008

### *Many program participants need training on unit features and amenities.*

MAHP staff and program participants reported that more training on unit features and amenities at move-in would have been helpful. Some applicants had not previously used a microwave oven; others were not familiar with smoke detectors. Air conditioners and the operation of windows were also noted as areas of confusion. Additional training might have reduced the maintenance workload and eased stress for residents.

## Community Response

### Observations

The timing of the implementation of AHPP, which started nearly two years after the disaster, makes it difficult to anticipate how a community might view the MAHP units immediately after a disaster. Several local officials said that the Cottages would have been more welcome immediately following the storms than they were later.

- ◆ The passage of time made local jurisdictions less willing to waive local zoning and permitting processes. At the point MAHP was implemented, communities were intensely engaged in economic and physical redevelopment activities. They feared progress in this area would be compromised by the installation of temporary housing—especially if it were likely that some of the temporary units would remain after March 2009.
- ◆ Local leaders also were influenced by the attitudes of vocal segments of the community who felt that the temporary housing period had gone on long enough and that local residents should have been able to “get back on their feet.”
- ◆ Long held perceptions about the desirability of trailers and mobile homes created resistance to the MAHP units. Before the hurricanes, most of the more populated jurisdictions had made efforts through zoning and code enforcement to remove mobile homes as a permanent housing resource in their jurisdictions or permitted them to be installed only in designated areas. The more rural jurisdictions generally had less restrictive regulations. Despite MAHP efforts to explain the higher standards to which the Cottages were built, negative perceptions about trailers and mobile homes transferred to the Cottages. MEMA overcame some of the objections by executing a memorandum of understanding (MOU) with each local jurisdiction detailing how Cottages would be used in the jurisdiction and by maintaining contact with local governments.

## Lessons for the Future

***A strong, comprehensive communication strategy for local officials and the public is needed.***

Community resistance to “homes on wheels” is a challenge, especially when some of the temporary housing is likely to remain in the community long after the disaster. MAHP negotiated agreements with each jurisdiction, prepared written materials and press information about the program and installed sample units in several locations for the public to tour. Despite this systematic communication effort, MAHP representatives indicated that more communication with local officials and residents was needed, especially at the program’s start-up. In retrospect, bringing together political representatives and program staff of each local jurisdiction in a workshop session may be a helpful approach.

***Pre-disaster planning should include strategies for addressing short- and long-term temporary housing and the use of modular units that could transition to permanent housing.***

The immediate, post-disaster period is a difficult time to engage in discussions about housing strategies that can affect the long-term landscape of a community. Local governments are dealing with multiple issues, including massive debris removal, restoration of infrastructure and planning for economic recovery. In Mississippi many local governments were operating out of temporary office space and coping with losses of data and systems. It is important for local communities to include short- and long-term housing needs in pre-disaster planning efforts. Agreeing on unit designs and occupancy policies in advance of a disaster will help foster a sense of control and mitigate future community resistance.

## Organizational Capacity and Implementation

### Observations

Mississippi was successful in implementing a large pilot program of more than 2,800 temporary disaster housing units in 17 months.

Several key factors appear to have been essential to this outcome:

- ◆ Based on prior experiences administering other emergency programs, MAHP was organized and implemented using the Incident Command Structure (ICS). Common in the emergency response field, ICS provides clear lines of authority and a structured method for outlining tasks and monitoring accountability. This structured approach enabled quick program implementation.
- ◆ MAHP benefited from significant political support, as well as access to state resources and expertise. Political support from the Governor's Office assisted MAHP in navigating relationships with communities. MAHP also accessed state administrative resources through the Department of Finance and Administration, as well as additional MEMA staff at critical program junctures. This sustained support provided a broad foundation for the program to move forward.
- ◆ MEMA elected to use contractors for MAHP with MEMA personnel providing oversight. This approach allowed the program to remain flexible, adjust staffing and revise policies as needed during the transition from temporary to permanent installations.

## Lessons for the Future

***A combination of disaster response, disaster recovery and affordable housing expertise is needed to successfully administer a similar program.***

MEMA's expertise in emergency operations enabled it to establish an effective new organization and to deal with significant logistics. However, MEMA's acknowledged lack of permanent housing expertise affected some of its policies and procedures and its ability to work with local partners. MEMA re-procured its contractor in part to access this additional expertise. For future programs, incorporating permanent housing expertise and capacity in the planning stages and throughout the program could help the implementing organization to anticipate issues and make the transition to permanent housing options smoother.

***Future programs should incorporate a stronger human services strategy.***

MAHP management and staff reported that they did not expect that residents would have such intensive service needs and were initially unprepared to facilitate connections to services for households with multiple problems or severe needs. Over time, the organization identified and referred participants to local organizations that provided necessary services. A strategy for identifying and accessing community services should be an integral part of pre-disaster planning efforts and an early focus in any temporary housing mission.

Details on MAHP's implementation through August 2008 are contained in the body of this report. The pilot program is ongoing through 2011. Further program updates will be provided in the 2009 interim report along with results of the first follow-up survey of MAHP participants.



# Chapter One: Introduction

This case study is the first installment of the quality of life evaluation for Mississippi. It describes and assesses program implementation of the Mississippi Alternative Housing Program (MAHP) from the start of the program in April 2007 through August 2008, about half way through the active grant period. This chapter describes the physical and social environment of South Mississippi after Katrina and provides an overview of Mississippi's recovery planning process. It also offers a brief overview of Mississippi's units and provides a description of the case study methodology at the end of the chapter.

Program implementation is reviewed in detail in the next two chapters. Chapter Two (*The Temporary Housing Story*) reviews start-up activities and the temporary placement of units, while Chapter Three (*Transition to Permanent Housing*) describes the recent shift to permanent installations. Chapter Four (*Preliminary Results of the Building Sciences Evaluation*) offers a building sciences review of the performance of MAHP units to date. Chapter Five (*Observations and Lessons Learned*) summarizes preliminary assessments of the Mississippi pilot and presents lessons learned to date.

## South Mississippi Before and After Hurricane Katrina

Hurricane Katrina struck the Gulf Coast on August 29, 2005, causing unprecedented damage to the State of Mississippi's infrastructure, housing stock, commercial property and economy, particularly the tourism and gaming industries. Flooding combined with a 30-foot storm surge swept away or severely damaged homes, roads and businesses that once were concentrated along the Gulf Coast. Exhibits 1-1 and 1-2 illustrate the impact of Hurricane Katrina on the coast. Moving inland, Katrina's wind and rain caused enough damage to the southern half of Mississippi that full federal disaster aid was available for residents of the 49 southernmost counties. Ultimately, the storm generated 46



Exhibit 1-1: Biloxi, Mississippi

Above: A Biloxi beach after Katrina on September 3, 2005.

Below: The same stretch of beach on November 3, 2005 after initial clean-up.

Photos: FEMA / Mark Wolfe





Exhibit 1-2: Damage from Hurricane Katrina.

A house was pushed off its foundation in Biloxi, Mississippi.

Photo: FEMA / Mark Wolfe



Damage to the Highway 90 bridge from Biloxi to Ocean Springs.

Photo: FEMA / George Armstrong

million cubic yards of debris, more than 350,000 Mississippians received FEMA Individual Assistance grants totaling approximately \$1.2 billion and 48,000 Mississippi households received a FEMA travel trailer or mobile home.<sup>1</sup>

All along the coast, Katrina washed away and damaged infrastructure, including roads, sewers and electric and natural gas lines. Several sections and bridges of Highway 90,

the beachfront drive that hugged the Mississippi Coast, were gone. Exhibit 1-2 shows the damage to the bridge between Biloxi and Ocean Springs. While striking progress has been made—two critical bridges have been restored—sections of Highway 90 are still under construction three years after Katrina.

Katrina also devastated Mississippi's coastal economy.<sup>2</sup> Prior to the storm, unemployment

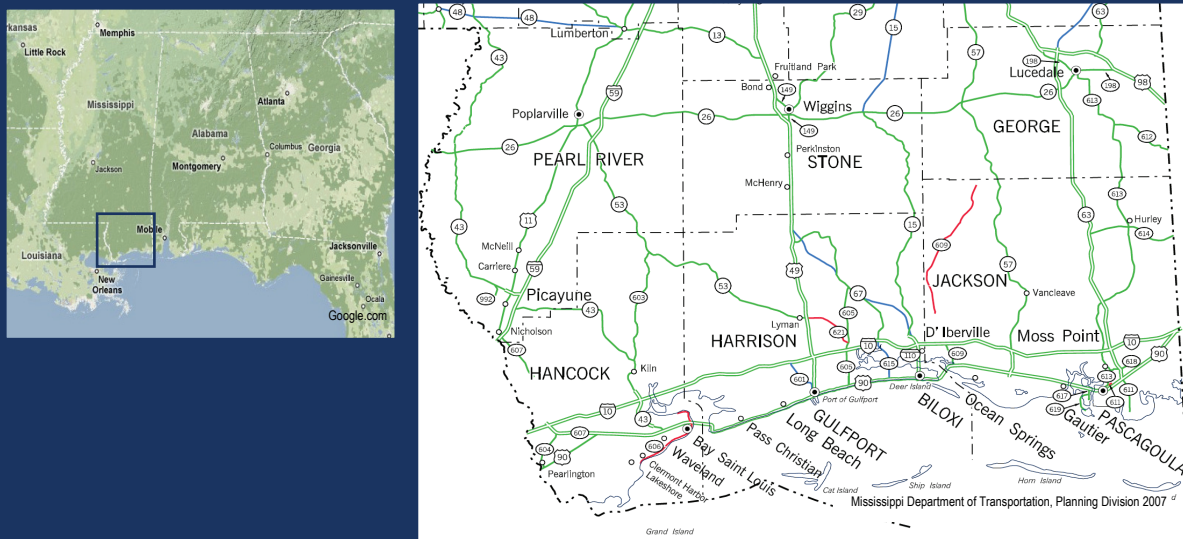
hovered around 6 percent across the three coastal counties. Immediately after the storm, in September 2005, the unemployment rate was over 22 percent; it did not return to pre-storm levels until the beginning of 2007. Revenues from gaming, a key industry along the coast, dropped from over \$105 million in August 2005 to \$0 in September and did not fully recover until early 2007. The damage to other businesses and the reduction in the consumer population also decimated sales tax revenues for municipalities.<sup>3</sup> As expected, economic losses of this magnitude have had ongoing impact on government tax revenues, especially for small, coastal jurisdictions.

This extent of damage required a measured recovery effort along the coast. As part of this endeavor, MAHP was implemented in the three coastal counties of Harrison, Hancock and Jackson and to a much more limited

degree in the more rural, inland counties of George, Stone and Pearl River. Exhibit 1-3 shows MAHP’s geographical coverage.

Prior to Katrina, over 40 percent of the total population of Mississippi’s three southernmost counties lived in Harrison County—which includes the coastal urban centers of Gulfport and Biloxi.<sup>4</sup> Harrison County also had the largest concentration of rental housing.<sup>5</sup> Because development was concentrated along the coast, nearly 60 percent of the housing stock in the lower three counties was damaged, with a disproportionate impact on rental housing.<sup>6</sup> Exhibit 1-4 shows a damaged multi-unit rental development that remained vacant in July 2008. The percentage of housing units that were damaged declined from west to east, so that 72 percent of housing units in Hancock County were damaged, 64 percent in Harrison, and 42 percent in Jackson County.<sup>7</sup>

Exhibit 1-3: MAHP’s Geographical Coverage



## The Mississippi Alternative Housing Program's Role in Recovery

A week after Katrina, Governor Haley Barbour initiated a recovery planning process by establishing the Governor's Commission on Recovery, Rebuilding and Renewal. Town hall meetings and planning workshops took place in the months following the storm to gather input from Mississippi residents, frame a vision for recovery and develop tangible recommendations for moving forward. Initial designs for alternative disaster housing units, namely the Katrina Cottage, were developed during this planning process. As a result of the Commission's final report, the Governor's Office of Recovery and Renewal was created to coordinate Mississippi's recovery efforts. In addition, Mississippi stakeholders advocated for a federal initiative to better address temporary disaster housing needs. These efforts contributed to the legislation that authorized FEMA to create the Alternative Housing Pilot Program.

By the time FEMA called for AHPP proposals, Mississippi had already constructed a prototype Mississippi Cottage, a variation on the Katrina Cottage, and convened builders, engineers, local officials and citizens to better understand options for rebuilding the coast's housing, in both the intermediate and long-term. In September 2006, the Governor's Office of Recovery and Renewal convened an Alternative Housing Design charrette and developed the proposal submitted to FEMA for the Mississippi Alternative Housing Program.

Through the competitive process, FEMA funded two of Mississippi's proposed pilot

Exhibit 1-4: Damaged Rental Units



A multi-family rental property situated between Gulfport and Biloxi that was still boarded up in July 2008. The property is several blocks from the coast and is typical of the rental units that have yet to return to the market.

programs. The State received \$275 million in AHPP funds for the Park Model and Mississippi Cottages, and a smaller allocation of \$6 million for the Eco Cottage (originally called the Green Mobile unit).

### The Program

The Mississippi Emergency Management Agency (MEMA) is the state entity responsible for implementing MAHP. MEMA develops Mississippi's emergency response plan and manages relief operations following a natural or man-made disaster. MAHP's Program Directors report directly to MEMA's Executive Director, and the agency works closely with the Governor's Office of Recovery and Renewal. MAHP's day-to-day operations are carried out by a combination of MEMA staff, other state employees and a team of contractors responsible for project management, design, engineering, manufacturing, hauling and installing units and maintenance. At the height of the temporary housing

program, about 100 MEMA and contractor staff persons were working on the program.

MAHP implementation includes a temporary phase and permanent phase. Temporary installations began in June 2007 and continued through July 2008. During this phase, MAHP executed agreements with local jurisdictions to establish where and under what circumstances MAHP units could be placed. Program applicants were responsible for securing a site for the Cottage on land they owned, borrowed or rented. Once an applicant and site were approved, MAHP installed the unit. Chapter Two describes program start-up activities and the temporary installation process.

The permanent phase officially began in April 2008, although MAHP had been working on developing permanent housing projects since the start of the program. Chapter Three details the shift to permanent installations.

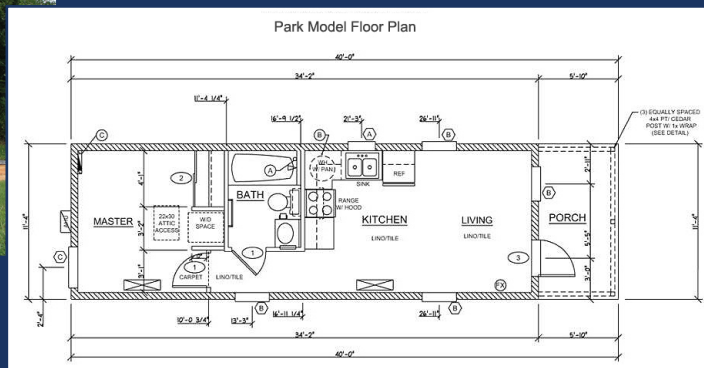
## MAHP Units

Ultimately the program will include four unit types, including:

- ◆ One-bedroom Park Models;
- ◆ Two- and three-bedroom Mississippi Cottages;
- ◆ Handicapped accessible, two- and three-bedroom Mississippi Cottages; and
- ◆ One- and two-bedroom Eco Cottages, both of which are accessible.

The Park Model and Mississippi Cottages are manufactured, modular, HUD-code certified housing units that meet the 2003 International Residential Code (IRC) and can withstand 150 mile per hour wind speeds. Both unit types reflect the regional Gulf Coast architecture, with hipped and gabled roofs, front porches and a cottage aesthetic. They are delivered on wheels and can be installed temporarily or permanently because the

Exhibit 1-5: Park Model Exterior and Floor Plan



removable under-carriage allows for installation on a permanent foundation.

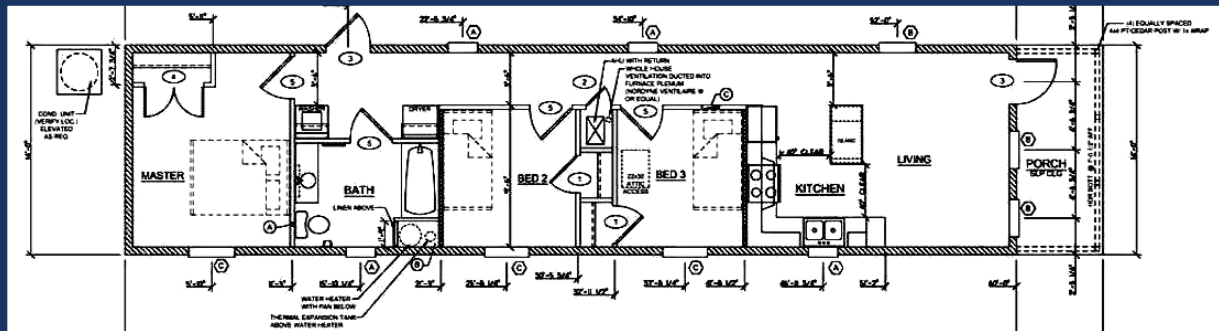
Park Models are one-bedroom units with 396 square feet of living space and are intended as a direct replacement for the 256 square foot FEMA travel trailers. In addition to being somewhat larger, the Park Model offers significant advantages in its structural design and floor plan; use of environmentally safer, energy efficient and more durable materials; and the addition of attic storage space. Exhibit 1-5 includes an exterior view of the Park Model and its floor plan.

The two-bedroom Mississippi Cottages have 728 square feet of living space and the three-bedroom has 840 square feet. The Cottages were originally intended to replace FEMA mobile homes, which are typically 840 square feet. The two- and three-bedroom units are available in fully accessible versions that are compliant with the Uniform Federal Accessibility Standards (UFAS). These Cottages include interior adaptations and ramp access to the unit for individuals with mobility disabilities. The exterior of a Mississippi Cottage and the three-bedroom floor plan are featured in Exhibit 1-6. Exhibit 1-7 displays photographs of a typical Cottage interior.

**Exhibit 1-6: The Mississippi Cottage**

**Right:** An exterior view of a Mississippi Cottage.

**Below:** The floor plan for the three-bedroom Mississippi Cottage.



**Exhibit 1-7: Typical Park Model and Mississippi Cottage Interiors**



Additions can be easily added to increase interior living space. The unit design was still underway as of August 2008. Exhibit 1-8 displays the preliminary Eco Cottage design and a one-bedroom floor plan.

In keeping with efforts to simulate disaster circumstances, FEMA required that the units come furnished with a sofa, dining table and chairs and bed frames and mattresses. The AHPP grant also required that MAHP provide “living kits” with each unit that included basic household items, such as linens, dishes, silverware and cleaning supplies.

Originally, Mississippi anticipated producing about 3,500 units, consisting of 3,400 Park Models and Mississippi Cottages and 100 Eco Cottages. These estimates have been reduced to 3,025 Cottages and Park Models and 80 Eco units as a result of increased costs for transitioning from temporary to permanent installations. As of August 28, 2008, Mississippi had installed and occupied 2,806 units. Exhibit 1-9 shows the pace of installation from the first unit on June 20, 2007 through August 2008. Exhibit 1-10 shows the location and distribution of occupied units across the six counties. Attachment 1 includes more detailed maps for coastal jurisdictions.

The Eco Cottage is an energy efficient, “green” modular unit that will be sited as permanent housing and will be available in one- and two-bedroom versions. It will be held to a higher environmental standard than the other designs, is fully compliant with the 2006 International Residential Code and uses Structural Insulated Panel (SIP) design.

Exhibit 1-8: The Eco Cottage

Right: A preliminary rendering of the Eco Cottage.

Below: The one-bedroom floor plan.

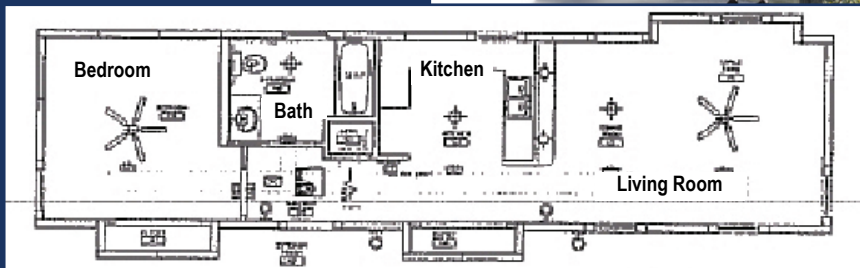


Exhibit 1-9: Number of MAHP Units Occupied by Month June 2007 to August 2008

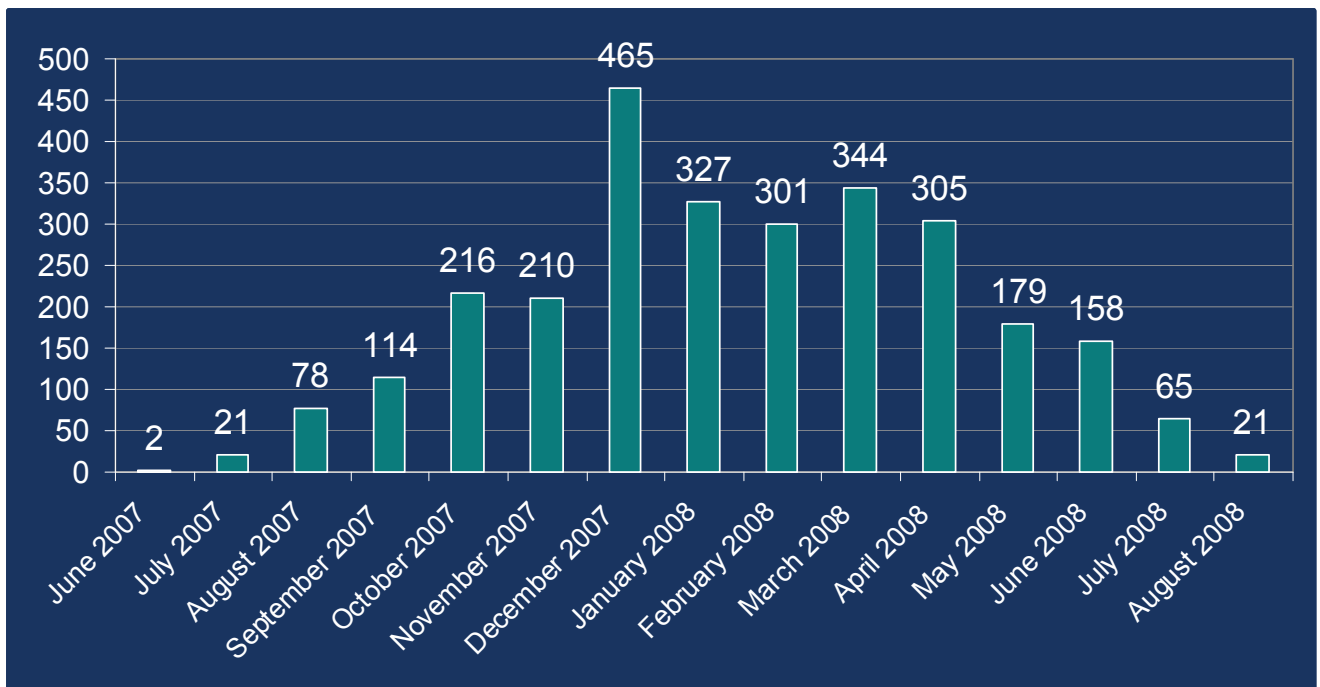
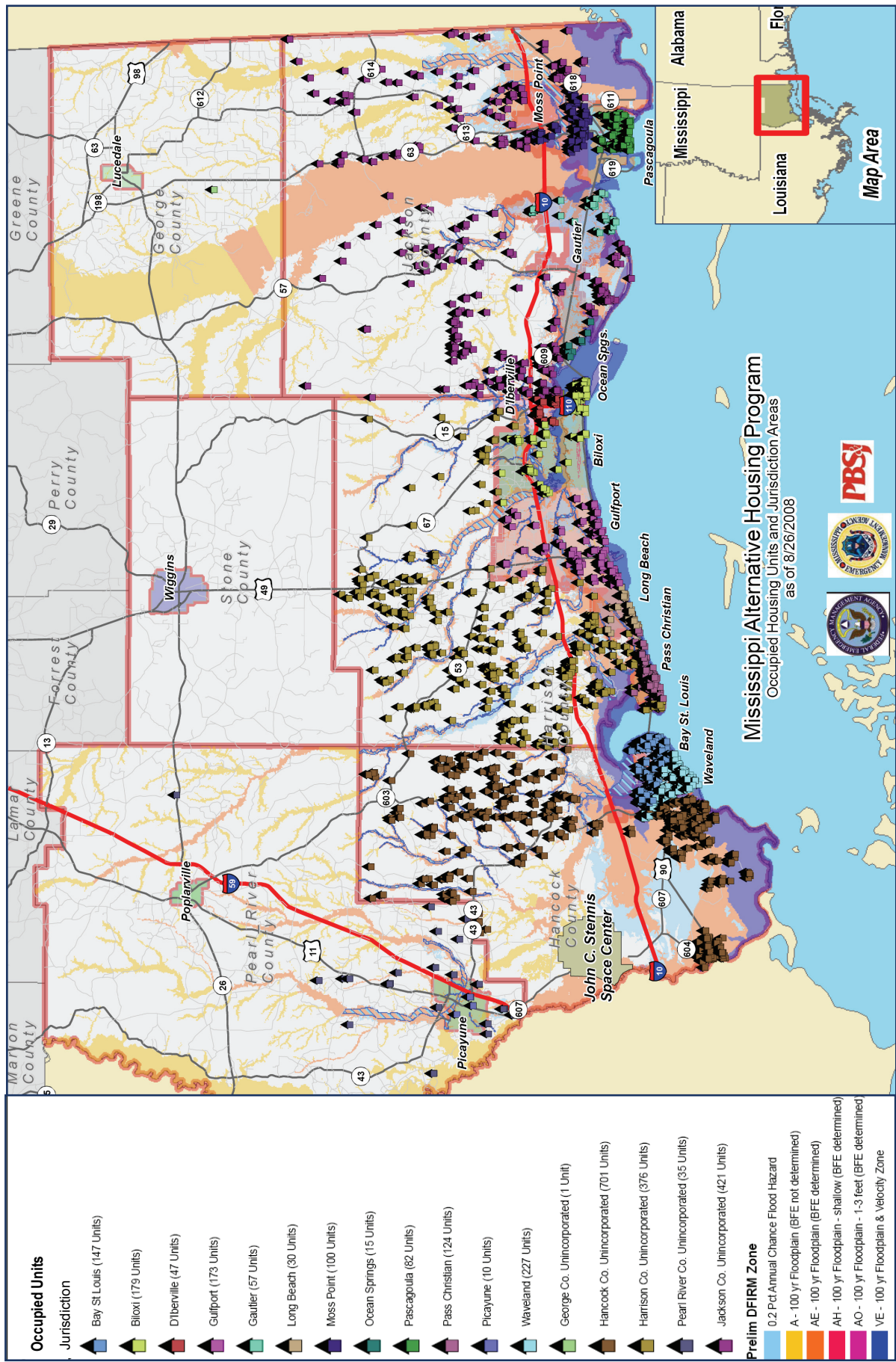




Exhibit 1-10 shows the distribution of occupied MAHP units over the program's six-county geography.



## Case Study Methodology

This case study is the first evaluation report for MAHP. A two-person evaluation team collected data for this report during three on-site visits, remote monthly monitoring of grantee activities via conference calls and ongoing reviews of program documents and reports.

The team visited the Mississippi Gulf Coast in November 2007, May 2008 and July 2008 and participated in FEMA-sponsored grantee conferences in February 2008 in Biloxi and June 2008 in New Orleans. They conducted in-depth interviews with MAHP staff—both MEMA employees and contractors—in individual and group interviews. They also conducted focus groups with staff persons who held the same MAHP positions in different counties, as well as staff who were working on a specific issue, such as permanent housing.

While on-site in November 2007 the evaluators informally interviewed eight MAHP participants, that is, no structured interview protocol was used. The evaluators sought to understand participants' impressions of the units and their experience with the program. The MAHP participants who were

interviewed were dispersed among the three coastal counties and selected by MAHP staff based on the availability of the participants. The conversations were intended to be used to inform the development of the participant survey and to obtain an early read on MAHP participants' opinions and experiences. (The fall 2008 participant survey will collect data in a structured, representative survey.)

Nearly 20 community stakeholders were also interviewed during three site visits. They included town mayors, city managers, zoning and building code officials, city council persons, representatives of non-profit organizations and a representative from a public housing authority. In a few instances, the evaluators conducted follow-up interviews with the same stakeholder to understand if and how attitudes towards the program had changed over time.

During the May and July 2008 visits, the evaluation team also observed a county board of supervisors meeting, a city council meeting and a meeting for an affordable housing coalition when MAHP was on the agenda. The evaluators also reviewed detailed program records and reports that were developed and archived by MAHP.

# Chapter Two: The Temporary Housing Story

This section describes MEMA's approach to organizing the program and implementing the temporary installations, including the barriers faced and how they were overcome during the first 17 months of program implementation.

## MAHP's Vision and Approach

Because the State quickly undertook a planning process and began implementing recovery efforts, the MAHP program did not start with a blank slate. By the time AHPP funds were awarded to Mississippi, considerable analysis of housing needs had been done, and design of a disaster housing unit that would fit in with Gulf Coast architecture was underway. MAHP's first Cottage was occupied 81 days after operations officially began in April 2007. By August 2008, over 2,800 Cottages had been delivered, installed and occupied. ("Cottage" will be used to describe all of the MAHP units except where distinction among the models is important.)

## The Vision

FEMA's pilot program challenged AHPP implementers to seek new housing types that would be feasible to deploy in future disasters, in addition to addressing the current needs of coastal residents still living in FEMA trailers and mobile homes. This concept was embraced by Mississippi, and as MAHP took shape, the program policies and schedules reflected a desire to simulate immediate post-disaster conditions. The intent was to test the ability of manufacturers to mobilize quickly, as well as the organization's capacity to identify eligible households and to receive, install and occupy units in large numbers. Key managers were committed to this emergency mindset and instilled a sense of urgency throughout the organization.

MEMA also took seriously the pilot aspect of the project by designating a project historian to record key milestones and to help with project documentation. MAHP intends to spend year three of the grant conducting its own analysis of the program.

## The Plan

MAHP adopted a management approach that is familiar in the disaster response community. The Incident Command System (ICS) provides a structure for establishing an organization and protocols for setting goals, assigning responsibility and tracking progress.<sup>8</sup> ICS was developed in the 1970s to address common weaknesses in emergency response situations such as lack of systematic planning and accountability, difficulty in interagency coordination and poor communications. It is used at all levels of government and by some private sector organizations and has been incorporated into FEMA's National Incident Management System (NIMS). ICS usually is organized around five major functional areas: command, operations, planning, logistics and finance and administration.

The ICS approach appears to have served the project well. Within the first quarter, MEMA had created a new organization focused solely on the MAHP program (including organizational charts, job descriptions and an initial training program), conducted outreach to over 14,000 families, negotiated MOUs with 14 local governments, and installed nine units and occupied two. The management approach was also reflective of—and well-suited to—the military backgrounds of key

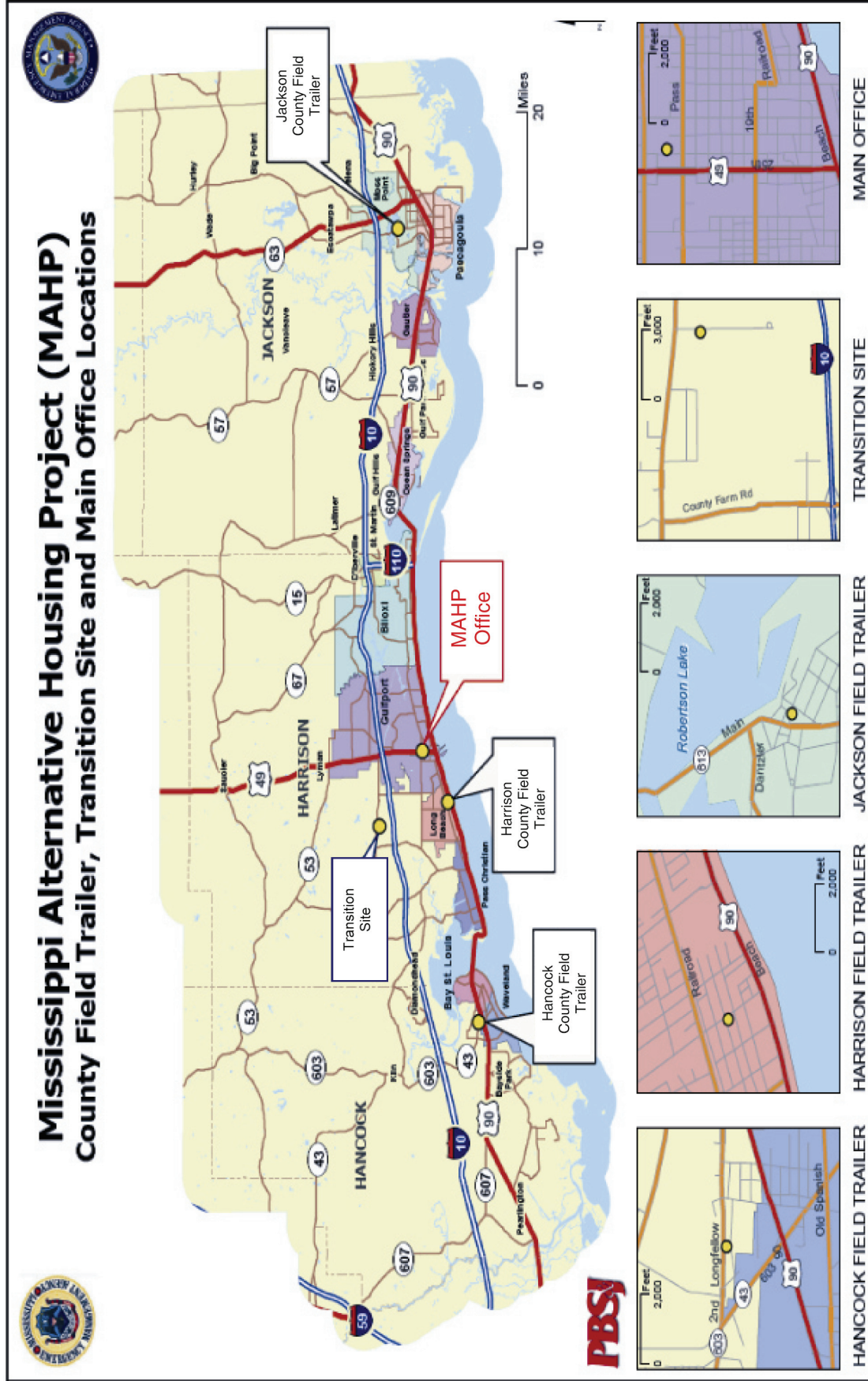
leaders, including the MAHP program director and MEMA's executive director, both of whom had served in the military.

As called for under ICS, MAHP immediately established detailed goals and performance standards to support the program's vision and codified them in a Performance Management Plan (PMP). The plan established specific targets for executing key tasks and developing policies and procedures, including: development of the management team, procurement of units, public and local government outreach, and design and implementation of a custom-built, automated workload tracking system. Attachment 2 summarizes the project's goals, which from the beginning called for the implementation portion of the program (i.e., construction, installation, occupancy, demobilization and disposition) to end in March 2009.

The organization measures progress toward the goals daily. It also publishes comprehensive quarterly reports that track progress against goals and contain policies, procedures and other key program documents that were created or modified during the quarter. This organized approach, combined with committed leadership and staff, played a significant role in the speed of MAHP implementation.

A headquarters office was established in Gulfport, and a transition site for receipt of Cottages was set up nearby. In addition, MAHP established small offices in each county, primarily for the use of site inspectors. See Exhibit 2-1 for a map showing the locations of the MAHP operational sites.

Exhibit 2-1: MAHP's Operational Sites



## The Team

The State contracted with Post, Buckley, Schuh & Jernigan, Inc. (PBS&J), a national engineering consulting firm, to provide management and technical support to the project. PBS&J had been involved in the AHPP application process, and was at work on the project before the MEMA management team was fully assembled. In order to move quickly, the management contract initially was not competitively bid. According to MEMA's Director, Mike Womack, the decision to use a contractor to manage significant portions of the program was based upon the positive experience the State had using contractors for the administration of approximately \$2.5 billion in FEMA assistance funds after Katrina. Although MEMA's staff was increased after the storm, it is a small agency and Womack believes that engaging contractors to complete the time-limited, day-to-day work while using State staff for high level oversight of the contracts is an effective model.

In addition to being responsible for program management, the PBS&J team included several subcontractors who were tasked with specific operational duties. Exhibit 2-2 shows the MAHP organizational chart as of the first quarter of operations, with State personnel, PBS&J staff and subcontractors separately identified.

Significant operational support was also provided by MEMA staff not directly assigned to MAHP, as well as the State Department of Finance and Administration (DFA). MEMA staff were available as needed and a few members were loaned to MAHP in the early

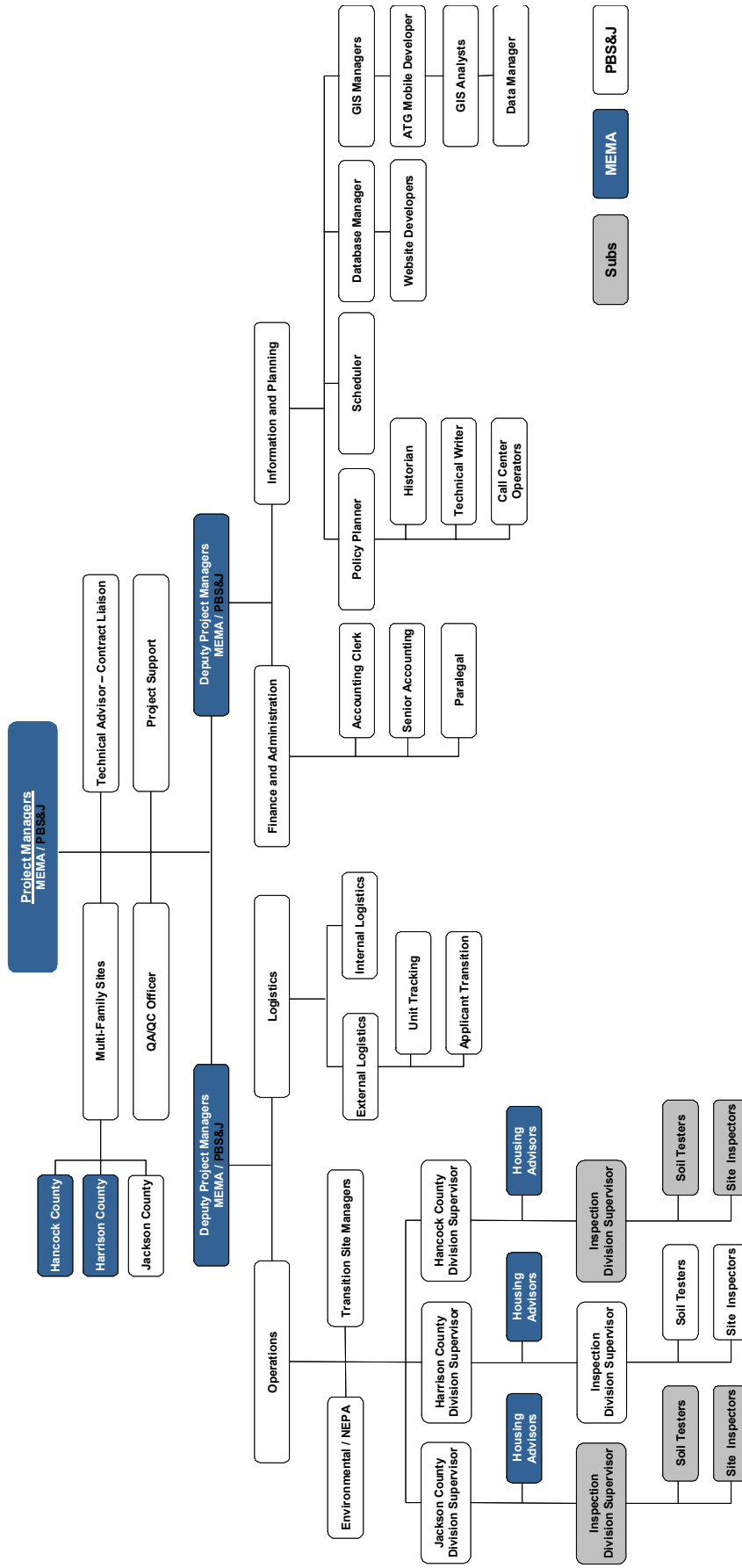
days of the program. MEMA enlisted DFA to provide finance and administrative support for the duration of the program. The department has played a key role in providing guidance and support for procurements.

MAHP also coordinated closely with the Governor's Office of Recovery and Renewal. The Office had a staff person assigned to the Gulf Coast who assisted MAHP work with the local jurisdictions. The Governor's office has been involved in key program policy decisions and later made a direct request for the participation of a handful of non-profit groups to assist with permanent Cottage developments. MAHP staff reported that support and coordination with the Office has been helpful, aside from a brief period of confusion about Governor's staff communicating directly with jurisdictions about MAHP.

## Relationships with Local Communities

Although each of the jurisdictions had signed a letter in support of the program when the MAHP grant application was submitted, MEMA committed to entering into a memorandum of understanding (MOU) with each local jurisdiction to specify how the Cottages would be used in that jurisdiction and where they could be placed. This turned out to be a more difficult and time consuming process than MAHP staff initially expected. Local government responses were driven by several forces, including the enormity of the recovery effort, concerns (and misconceptions) about the Cottages themselves and perceptions of the circumstances of households that

Exhibit 2-2: MAHP Organizational Chart – First Quarter



remained in FEMA units. These three factors are discussed in the sections below.

## Challenges and Opportunities

The challenges continue to be enormous for the local jurisdictions affected by Katrina. As the MAHP program began, local leaders—many of whom had been personally affected by the storm—were intensely engaged in applying for and managing funding from multiple federal and state agencies. They were also overseeing major public construction projects, as well as planning for the short- and long-term restoration of the region’s economy and tax base. The overwhelming demands of recovery were compounded by the fact that most

communities lost local government facilities and were operating out of temporary offices in mobile homes. Many continue to do so three years after the hurricane (see Exhibit 2-3).

The storm is behind us and we are now dealing with the reality that post-Katrina decisions and solutions are very complicated...we are traveling uncharted waters. No American community has had to face rebuilding after a catastrophe the scale of Hurricane Katrina. We are seeking solutions that have never been necessary.

---- Gulfport Mayor  
State of the Union address 2007



Exhibit 2-3: Many local governments are still operating out of temporary trailers.

Left: Temporary government offices in Waveland, July 2008.

Below: Temporary government office in Pass Christian, July 2008.





Ironically, in some areas damage was so complete that it presented the opportunity to consider approaches to development that might not have been feasible before Katrina changed the landscape of communities. The priority list was long, and housing was not necessarily at the top of that list. When first contacted for this evaluation in November 2007, one local government official characterized the situation this way: "I don't have time right now to think about housing." His priority was restoring the basic infrastructure and economy of the town. Eight months later during a second interview in July 2008, it was clear that affordable, rental housing and the needs of owners who had not been able to rebuild had moved closer to the top of the list.

### Perceptions of the Cottages

Some community resistance was related to perceptions and misperceptions about the MAHP units. Both MAHP staff and local government representatives said that if the Cottages had been available shortly after the storm, local communities would have welcomed them with open arms. The localities would have been less stringent about permitting requirements and they would have allowed the Cottages to be placed in any available location.

"They say it's temporary but once they're here... we all know what's going to happen..."  
---- Local Official, November 2007

However, an entirely different set of circumstances existed 18 months after the storm. Local communities were focused on recovery, not emergency response, and the landscape in which the MAHP program operated was in some ways much more complex. Some local government reactions to MAHP reflected the attitudes of vocal segments of the community who were experiencing what some locals called "Katrina fatigue." They wanted the FEMA trailers removed as a sign that things were returning to normal. To these individuals, the idea of bringing yet more "temporary," disaster housing to the area seemed contradictory, and perhaps detrimental, to encouraging people to rebuild permanent housing.

By this time it was difficult for communities to think about the Cottages for temporary housing without also thinking about the likelihood that some would remain in the communities as permanent housing. These concerns were exacerbated by the multiple extensions FEMA gave for travel trailer occupancy. Even though MEMA was publicly committed to demobilizing MAHP by March 2009, local leaders feared that a similar extension process for the Cottages was inevitable.

Owners who had rebuilt or were in the process of rebuilding were articulate and vocal in their concerns about how property values would be negatively affected by the Cottages. They argued that the size and style of the Cottages did not fit with many neighborhoods. There were notable exceptions, including one beachfront owner who said: "It's not my

business what people put on their own land. I think my neighbor's \$300,000 house is ugly, but it's his decision."

Local officials also made the argument that the small Cottages (if retained for permanent

housing) would do less to restore the tax base than larger, more expensive homes that existed before Katrina or new, high-rise condo or apartment buildings that could now be built.



#### Exhibit 2-4: Housing Characteristics Along the Gulf Coast

The quality and size of housing stock varies throughout the Mississippi Coast.

1. A Park Model next to a large home which is under construction near the waterfront.
2. More modest housing in Pascagoula, typical of older neighborhoods, where Cottages might be suitable.
3. A non-MAHP house in Bay St. Louis that typifies cottages in the neighborhood.
4. One of a handful of substandard mobile homes in a Gautier commercial park that may propagate negative community perceptions of mobile units, and, by extension, the Cottages.
5. A series of brightly-colored, non-MAHP cottages in Bay St. Louis.



The appropriateness of these arguments seemed more compelling in some locations than others. While a Cottage may look out of place next to a large, beach-front home, each jurisdiction appears to have older neighborhoods in which a Cottage could blend in with the neighborhood. Exhibit 2-4 illustrates this diversity.

MAHP's proposal to develop group sites met the most resistance of all. Concerns about recreating some of the visual and social problems experienced in FEMA trailer parks made the idea of creating new MAHP group sites unpalatable to local communities. As a result, MAHP staff worked with the jurisdictions to make maximum use of spaces available in commercial mobile home parks in order to accommodate renters who needed a site for a Cottage. Fourteen jurisdictions ultimately approved using Cottages in existing commercial parks.

### Perceptions of Need

Another contributor to the resistance that MAHP encountered stemmed from perceptions of fairness and about whether the units were actually needed. Individual citizens and local officials generally had great compassion for the friends and neighbors they knew who were still not settled. However, a perception that "others" were abusing the system was widely discussed. At city council and county supervisor meetings, as well as in everyday conversations, anecdotes abounded about families who "weren't even trying to recover," "weren't even living in the FEMA units" (and perhaps were renting them out)

or were just "hanging on for the free rent." Although these discussions were omnipresent, when MAHP staff requested specific information about cases of abuse the response was often that someone "had heard" about a case. Housing advisors, who were the direct intermediaries between families and MAHP, were asked to pursue any specific complaints that were made. It is possible that some families stayed in FEMA trailers as a matter of convenience, but others faced a different reality. The remaining FEMA trailer occupants included homeowners who were still having problems with insurance settlements, elevation requirements, financing or access to reliable contractors, as well as former renters who reported they were unable to find affordable rental housing. Several MAHP and local officials explained that the substandard rentals that low-income households rented before the storm for as little as \$300 a month were destroyed.

"We lost everything too and got back on our feet with the same help they got, and now they'll get more."

---- Hancock County Resident

Some households were just "stuck," without a plan for rebuilding. These included elderly owners without the emotional and financial strength to rebuild and individuals who could neither rebuild on nor sell the site of their pre-storm residence. Still other individuals were in a state that MAHP housing advisors called "paralysis"—those who were still traumatized into inaction.

## Negotiating the MOUs

All of these concerns were brought to the table when MAHP staff began to negotiate MOUs with each jurisdiction. A sample agreement is provided in Attachment 3. The standard language found in most agreements authorized participants to stay for a minimum of 6 and a maximum of 24 months and included an acknowledgement that some units might be placed temporarily below the jurisdiction's Advisory Base Flood Elevations (ABFEs; see Exhibit 2-5). Cottages were placed below the ABFEs only when a Cottage was replacing a FEMA travel trailer on the same site.

Ultimately MOUs were tailored to meet the needs of each jurisdiction. The modifications focused on specific concerns the jurisdictions had about the quality of units and unit installations, and the use of units for permanent housing. For example:

- ◆ The City of Moss Point permitted units only on private residential lots (no group sites or commercial lots) and initially restricted occupancy to one year.
- ◆ The City of Pascagoula gave blanket approval to place Park Model units wherever a travel trailer existed, but individual approval was required for

placement of the larger Cottages. The agreement also defined MEMA's responsibility for the cost of installation maintenance, demobilization and reasonable site restoration.

- ◆ Several jurisdictions (Gulfport, Bay St. Louis, Pascagoula, Gautier) required applicants to provide specific evidence that they were rebuilding a permanent unit in order to obtain a permit for placement of the Cottages.
- ◆ Harrison County and Pass Christian authorized the placement of Cottages only where local zoning allowed modular and manufactured homes, and required applicants to follow the normal process for obtaining a zoning variance if they wished to place a unit elsewhere in the jurisdiction. Pass Christian's agreement further specified that "no person will be allowed to purchase the units from the State of Mississippi" at the end of their occupancy and reminded the State that "time is of the essence" in the removal of units.

The MOU process proved to be time consuming, confusing and sometimes frustrating for all concerned. Having to understand the nuances of requirements across the jurisdictions was challenging for MAHP staff and contractors. Some

### Exhibit 2-5: Advisory Base Flood Elevations and the National Flood Insurance Program

After the 2005 Hurricanes, FEMA adjusted the existing Base Flood Elevation (BFEs) maps to account for storms over the past 25 years. The result of this process was the Advisory Base Flood Elevations (ABFEs). The ABFEs are much higher than previous BFEs, due largely to the scope and scale of Katrina. ABFEs are used to help communities manage vulnerability in floodplains and to determine elevation and other requirements for participation in the National Flood Insurance Program (NFIP). The National Flood Insurance Program (NFIP) was established in 1968 to help communities minimize flood damage and provide flood insurance to property owners.

jurisdictions modified the requirements multiple times—and not always through the MOU process. Sometimes MAHP staff would discover the process had unexpectedly changed as they presented what they thought was a site ready for permitting. MEMA overcame these problems by minimizing staff turnover and transfers between jurisdictions. This allowed assigned staff to build relationships with the local office and stay more informed about changes.

On the other hand, local jurisdictions were sometimes frustrated by MAHP's lack of knowledge about jurisdictional boundaries and the occasional resulting mistakes when MAHP staff applied criteria from the wrong jurisdiction to a site. One local government complained that MAHP staff frequently submitted incomplete site plans for unit installations.

## **Manufacturing, Installing and Occupying the Cottages**

This section discusses the overarching implementation issues related to the manufacture, installation and occupancy of the units. A more detailed description of unit components and characteristics and a discussion of the technical challenges MAHP encountered in designing and manufacturing units is included in Chapter Four.

Once the Park Model and Mississippi Cottage designs were complete, MAHP issued a series of Requests for Proposals (RFPs) and held pre-bid conferences with interested manufacturers with support from the State Department of Finance and

Administration. Failure to correctly handle the public advertisement for the initial order of Park Models caused a small delay. MAHP procured units from 6 different vendors operating in 10 separate locations.

The original RFP called for manufacturers to both manufacture and install the units, but MAHP determined that a separate haul and install contract was more appropriate. The original plan had been to transport the Cottages directly to the sites where they would be installed. However, it quickly became clear that a transition site would be needed where the units could be accepted, repaired if necessary and held until sites were ready. Directly contracting with local haul and install contractors also allowed MAHP to have more control over the timing and ensure that the installation was coordinated with the permitting and applicant preparation processes. MAHP also avoided creating competition for local installation contractors between manufacturers, which might have potentially inflated costs.

## **Quality Management**

Cottages were received, inspected, accepted and deployed to sites from the transition site in Gulfport. Exhibit 2-6 is an aerial view of the transition site. When they arrived, the Cottages were logged into the inventory (units were barcoded). Each unit received a close visual inspection to check construction features such as exterior siding, roofing, drywall installation, interior and exterior paint, kitchen and bathroom fixtures and functionality of windows and doors. Utilities and appliances were tested. Any

problems identified were photographed for the record.

Despite the initial design work, changes to specifications were made numerous times as actual units came off the line and problems were identified. Each issue required program staff to determine whether the problem was with the unit design, materials or manufacturer workmanship. When changes were made, decision making was documented using a formal issues management process that recorded the problem, the solution and the final decision.

Exhibit 2-6: Aerial view of MAHP transition site near Gulfport., MS. Photo courtesy of MEMA, September 2007.



While all manufacturers were required to use materials of equal quality, the quality of the finished product varied considerably. Especially in the beginning, numerous discussions among MAHP staff and manufacturer representatives were needed to develop a common vision of what an acceptable unit should look like. Attention to detail was a mandate from the very top of the MAHP organization. In the early days of implementation the MAHP program director personally inspected units to ensure that the units met aesthetic as well as technical

#### Perspectives on the Cottages November 2007

“We knew from the beginning the quality of the units was the key.”

--- Becky Baum, MAHP Program Director

“Initially I didn’t understand the balance between speed and quality. I would have gone more slowly in the beginning.”

--- Manufacturer

standards. She believed that the success of the MAHP program depended on the ability to produce a sound and attractive unit that would unquestionably enhance the quality of life for occupants and could gain acceptance in the community.

Managing the transition area was also a challenge. MAHP staff attempted to pace deliveries and deployments in such a way that fewer than 300 cottages would be on site at any given time. During a visit to the site, the Governor made the statement that he did not want the transition site become “another Purvis,” referring to an overcrowded FEMA travel trailer storage site located just outside of Purvis, Mississippi, where thousands of units were stored inches apart.

In December 2007 an inspection of units by FEMA and HUD experts determined that MAHP accessible units did not fully meet the Uniform Federal Accessibility Standards (UFAS). MAHP’s response was two-fold. First, changes were made to the specifications for future units. Second, occupants living in accessible units were surveyed to determine whether they had any problems with the accessibility of their existing units and whether they wished to swap them for UFAS-

approved units. No problems were reported by the occupants and retrofitting of units or unit exchanges were determined to be unnecessary. MAHP program administrators expressed frustration about the lack of initial guidance on UFAS requirements that led to the finding. However, the finding did not cause significant delays for the program.

## Linking Cottages and Families

### Outreach and Selection

Eligibility for the program was initially limited to households that were permanent residents of Hancock, Harrison and Jackson counties on August 29, 2005. Applicants must have also been living in a FEMA-provided travel trailer or mobile home on April 1, 2007 and still in need of housing assistance for at least six months at the time of application. Eligible applicants had to be listed as an applicant or co-applicant in FEMA's database. Once selected, applicants were responsible for providing an acceptable site, either on private land that they owned, borrowed or leased, or in a commercial mobile home park. For renters or other applicants without suitable land, MAHP provided a list of commercial parks that were willing to work with the program and had available pads.

Because FEMA's list of approximately 14,000 households suggested that the need would be far greater than the number of units available, MAHP decided to use a random selection process to determine who would receive a Cottage. To ensure objectivity and fairness, applicants were selected randomly

### Eligibility for MAHP

- ◆ Permanent resident of designated counties on August 29, 2005
- ◆ Listed in FEMA's database and living in a FEMA-provided travel trailer or mobile home on April 1, 2007
- ◆ Must have a need for alternative housing for at least 6 months
- ◆ Must have a site acceptable to MEMA and the local jurisdiction

from a pool that provided proportional representation for each of the three participating counties. MAHP decided to both call and mail the selected households.

A call center was established and MAHP began to contact the selected families. Households that expressed interest were sent additional information about program requirements. Demand turned out to be much smaller than was initially assumed. The call center had difficulty reaching applicants using the contact information from FEMA's database, and many letters were returned as undeliverable. Some families who were contacted reported that they no longer needed temporary housing. Others had multiple questions and concerns about how the program would work, including the applicant's responsibility for utilities, the size of the unit they would be offered, whether the units would be available for sale and the effect acceptance of the MAHP unit would have on eligibility for FEMA assistance. (To be eligible, households had to agree that if they were accepted into the MAHP program they would be ineligible

for further assistance from FEMA for Hurricanes Katrina, Rita and Wilma.)

The Governor's office requested that every effort be taken to reach eligible residents, and the program went to great lengths to try to contact them. A second call center was opened in Jackson to take questions about the program and enable the call center staff in Gulfport to make outgoing calls. It was decided that an attempt would be made to hand deliver the approximately 2,000 returned letters, and staff from MEMA's central office were borrowed for this activity. MEMA also embarked on a publicity campaign and community outreach efforts. As part of this effort, the project hosted two open house events in Gulfport and Waveland. For each of these events, a one-bedroom Park Model was temporarily installed, and MAHP housing advisors and manufacturer representatives were available to answer questions.

MAHP had always planned to expand the program inland to Pearl River, George and Stone Counties if demand was not sufficient in Hancock, Harrison and Jackson Counties. Because demand in the three coastal counties was smaller than expected, early in 2008 the program was expanded. Units were eventually placed in Pearl River and George Counties, but not in Stone County.

## Site Approval and Installation

By far, the biggest constraint on program participation was the availability of an eligible site. Once an eligible applicant proposed a site, an inspection was

scheduled. PBS&J inspectors determined if a unit could be placed on the site, located utilities and identified any apparent connection issues, marked utility line locations, performed soil density tests to ensure a unit could be anchored properly and checked for environmental and historic preservation issues. FEMA representatives had to give environmental clearance for each site.

MEMA housing advisors worked with applicants to explain program requirements, obtain needed signatures and assist them to obtain permits from local jurisdictions. This was not a simple process and included the following forms:

- ◆ The Applicant Site Responsibility Form specified applicant responsibilities for preparing utilities on the site;
- ◆ The Applicant Transition Understanding Form explained that applicants might need to find a place to stay for the period between the removal of the FEMA trailer and Cottage installation;
- ◆ The Waiver Agreement acknowledged that acceptance of a Cottage would result in the applicant being ineligible for any further FEMA aid for Hurricanes Katrina, Rita or Wilma; and
- ◆ When applicable, a Request for Reasonable Accommodation Form was used to request a UFAS Cottage.

The site approval process challenged MAHP organizationally as well as technically. Initially lack of coordination was a problem. Independent site visits were made by inspectors and housing advisors, and



communication about which sites and applicants had completed the necessary steps was difficult. Neither group fully understood the whole process. As one housing advisor put it: “I do my part and then it goes into some “round about” in the office, I’m not sure what that is.” The result was a backlog of cases where housing advisor tasks were completed and inspector tasks were not and vice versa.

**“It’s like we are putting on a ballet and a bunch of the dancers have not been coming to practice.”**

**----- MAHP Director, November 2007; Referring to coordination difficulties within the MAHP team**

In November 2007, the MAHP program director took steps to remedy the situation. She declared a “one-organization” focus and established joint teams composed of MEMA housing advisors and PBS&J inspectors by county. In addition, MAHP adopted a process of having PBS&J inspectors and MAHP housing advisors schedule a single appointment with the applicants whenever possible. To emphasize the need for coordination, office space was rearranged to seat the PBS&J and MAHP county teams together, and MAHP managers made clear that success depended upon the two parts of the organization communicating and coordinating more effectively.

## **Unit Installation**

A similar set of coordination issues arose after the sites were approved. The haul and install contractor, inspectors, housing advisors,

applicants, building officials and the utility company all had to work in tandem to make a unit ready for occupancy. The haul and install contractor was responsible for transporting the unit to the site, setting and tying down the unit and hooking up utilities in accordance with local codes. The contractor also inspected unit interiors and repaired any obvious problems or damage that may have occurred during transport from the transition site. The final electrical connection often caused a delay, sometimes because of utility company scheduling and other times because applicants had difficulty raising the required utility deposits. When necessary, housing advisors helped the applicants find utility deposit assistance from local nonprofit organizations.

MAHP modified installation procedures multiple times as experience identified problems or better approaches. Sometimes manufacturer installation instructions were unclear or had to be modified. Other adjustments were made in protocols when the proposed approach did not work out as well in practice as in theory. One example was the decision to install air conditioners for the Park Models once the unit reached the final site, rather than at the transition site. Another example was developing the right anchoring techniques for different types of soil. MAHP went through several modifications on anchoring the units.

## Occupancy Standards and Move-In Procedures

One of the significant challenges for the housing advisors during this process was helping to determine the unit size a family needed. Initially MAHP established occupancy standards that were intended to simulate disaster conditions. This meant that a four-person household could be assigned the one-bedroom Park Model, assuming that a couple would sleep in the bedroom and two people would sleep on the full-size sleep sofa in the living room. See Exhibit 2-7 for details on MAHP's initial "right-sizing" standards. Two people sleeping in the unit's living room proved difficult for both young children or teenagers. MAHP received numerous requests for exceptions to would allow households to receive larger units.

One unintended consequence of the "right-sizing" policy was an increased demand for UFAS compliant units. MAHP staff reported that as applicants came to realize that all of the

UFAS- compliant units were two- and three-bedroom units, declarations of the need for an accessible unit increased. Some of those requesting the units were disappointed to hear that documentation of a household member's mobility limitations was required.

In fall 2007, MAHP determined that the immediate post-disaster occupancy standards did not work well for a pilot program implemented two years later and liberalized the standards. Housing advisors reported that this switch caused some frustration among participant households that received units in the first months of the program. It was difficult for them to understand why a neighbor or friend with the same family size received a bigger unit.

When a unit was ready for occupancy, housing advisors scheduled a move-in session with the applicants. During the move-in, the occupants and housing advisors walked through the unit, the occupants received keys and completed any outstanding paperwork. The move-in

### Exhibit 2-7

#### Initial "Right-Sizing" Criteria

Participants were assigned to a Park Model (one bedroom: one full-size bed, one full-size pull-out couch) if they were:

- ◆ A single person or a couple
- ◆ A single parent or couple with up to two children of the same sex regardless of age or two children of the opposite sex under the age of six (6)

Participants were assigned a two-bedroom Mississippi Cottage (two bedrooms: one full-size bed, one twin bed, one full-size pull-out couch) if they were:

- ◆ A single parent or couple with two (2) children of the opposite sex over the age of six (6) or three (3) children regardless of age

Participants were assigned a three-bedroom Mississippi Cottage (three bedrooms: one full-size bed, two twin beds, one full-size pull-out couch) if they were:

- ◆ A single parent or a couple with four (4) or more children regardless of age

process involved explaining and obtaining applicant signatures on another set of key documents, including:

- ◆ The Lease Agreement between MAHP and the occupant (if it was not previously signed);
- ◆ The Pet Addendum, to clarify the occupant's responsibility for damage done to the unit by pets;
- ◆ The Maintenance Agreement, to clarify the occupant's maintenance responsibilities; and
- ◆ The Right of Entry/Ingress-Egress Agreement, stating that MAHP has the right to enter the unit and that the occupant will not place the unit on the lot in a way that prohibits entry and exit from the property.

The evolution of these documents, as well as the previous list related to site approval, illustrated the changing nature of MAHP's policies and procedures. As new issues arose, MAHP created new forms, policies and procedures. MAHP's organized approach and attention to detail were a plus in these situations.

## **MAHP Occupants**

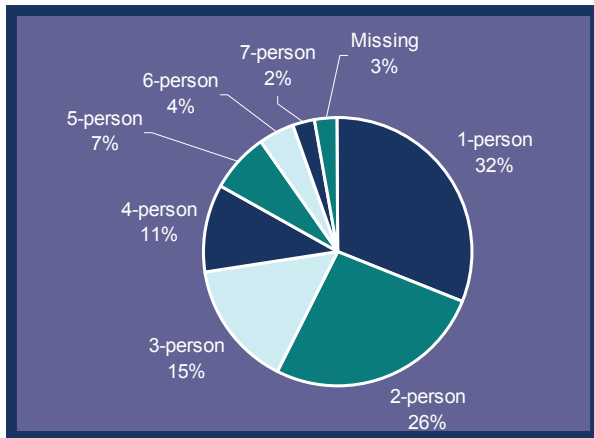
This section describes the demographic characteristics of MAHP households as captured by the evaluation baseline survey. It was voluntarily completed by participants. Prior to the procurement of an evaluator for AHPP, the baseline evaluation survey was distributed by mail by the U.S. Department of Housing and Urban Development to over 14,000 households who, based on FEMA data,

were eligible for MAHP. The baseline survey response rate in Mississippi was very low—only 1,175 households returned a survey. Further, only 447 households that completed a baseline survey actually received a MAHP unit. This is only 16 percent of the 2,806 households that received a MAHP unit by the end of August 2008. There is no way of knowing how this data may be biased. A fall 2008 survey will collect representative demographic information on MAHP participants, and these data will be reported in the Mississippi Interim Report in early 2009.

The following section outlines key demographic characteristics of MAHP participants based on the 447 baseline survey responses from households that received a unit. It further compares baseline survey information with pre-Katrina demographic data (Census 2000) for the six counties where the program operates.

### ***Household Size***

MAHP households tend to be smaller than the pre-Katrina population overall. A majority of MAHP households consist of one or two people. Exhibit 2-8 shows the proportion of household sizes among MAHP participants. Single-person households composed 23 percent of pre-Katrina households, nine percentage points lower than among MAHP households.



**Exhibit 2-8: Distribution of MAHP Household Sizes**

### ***Race and Ethnicity***

Similar to the pre-Katrina population, most of the MAHP participants are white. Eighty percent of the responding heads of household identified their race as white and 18 percent identified as black. In the pre-Katrina population as a whole, 78 percent of people were white, 18 percent were black and the remaining 4 percent identified themselves as belonging to another race.

### ***Education Level***

MAHP participants are slightly less educated than the pre-Katrina population overall. While most MAHP respondents have a high school education or higher, 24 percent of heads of MAHP households never received a high school diploma compared with 21 percent of the pre-Katrina population overall. Eighteen percent of MAHP households have an associates degree or higher, six percentage points lower than pre-Katrina households overall (24%).

### ***Households with Disabilities***

MAHP households have a high rate of physical disabilities. Nearly 43 percent of households reported a member with a physical disability or a condition that limits one or more basic activities. Of households with a physically disabled member, 30 percent contained someone in a wheelchair or someone who could not climb stairs at all. Nine percent of households have a member who is blind or deaf.

### ***Employment***

Slightly fewer MAHP heads of household participate in the workforce than the working-age, pre-Katrina population overall. About half (49%) of MAHP heads of households were employed full-time, part-time or self-employed at the time they completed the survey; six percent were unemployed and looking for work. In comparison, 55 percent of the pre-Katrina population aged 16 and over were employed.

### ***Pre-Katrina Housing Tenure***

Most MAHP households, 71 percent, were homeowners prior to Hurricane Katrina; 24 percent were renters. (The remaining 5 percent did not answer the question or had other housing arrangements.) The homeownership rate is consistent with the housing tenure of all households prior to Katrina, when 71 percent of households were homeowners and 29 percent were renters. Fifty-four percent of MAHP households were living in a single-family detached home, and 31 percent were living in a mobile home on their own or leased land prior to the storm. Pre-Katrina

housing units were destroyed or severely damaged for nearly 80 percent of households. Nevertheless, 42 percent of MAHP households intended to rebuild or repair their damaged home.

## Ongoing Management

Within a few months of startup MAHP was a landlord on a large scale. Occupied cottages were spread across the three-county area, and plans were being made to extend the program to the three additional counties. Although MAHP did not charge rent for the units, they had to address other normal aspects of the tenant/landlord relationship. Emergency and routine maintenance issues had to be addressed; residents moved out and units had to be demobilized; occupants who did not take care of their units had to be counseled and a few were ultimately evicted. One unit was significantly damaged by fire because the occupant was operating a "meth lab" in the unit.

The role of the housing advisor changed from one of site facilitator to a more traditional counseling role. With caseloads of 50 to 150, housing advisors reached out to occupants monthly (mostly in person) to ensure that the units were being well maintained, to inquire about the progress occupants were making toward their permanent housing plans and, when needed, to make referrals to needed resources and services. Because most of the attention of MAHP leadership was still focused on installing and occupying units as this transition occurred, housing advisors operated fairly independently. They consulted with their

supervisors only when they could not solve problems for themselves.

Housing advisors reported that they had difficulty meeting with some occupants because the families had resumed their normal lives and were too busy. Other occupants had multiple challenges, and the advisors did their best to connect them with appropriate resources. This appeared to result in some frustration on the part of housing advisors and some "reinventing of the wheel," as each advisor attempted to develop his or her own approach to assisting residents and list of available community resources.

The advisors completed a survey form with each visit. The survey collected information about the household's progress with permanent housing planning, surveyed the condition of the unit and provided utility cost information. One apparent gap in the MAHP system was that these documents were completed but the data was not entered into the automated management database or summarized in any way. The lack of accessible information from these surveys ultimately hindered the development of MAHP's permanent housing policies.

Many housing advisors developed close relationships with "their families," and it appeared they often went well above and beyond the normal job description. For example, one advisor noted that if a client seemed uncertain or confused during the move-in process, his last action was to program his telephone number in the resident's phone.

## Maintenance

The primary purpose of AHPP is to test the usability and durability of alternative disaster housing types. A full assessment of the Mississippi Cottages by the building sciences evaluation contractor is underway and the forthcoming quality of life participant survey will ask people living in the units about usability and maintenance. The discussion of maintenance in this chapter focuses on process and provides preliminary anecdotal information about maintenance issues from the perspective of MAHP staff and Cottage residents.

Maintenance issues were identified in one of several ways. First, MEMA or contractor staff sometimes identified problems with units during installation. After the Cottages were occupied, maintenance problems could be reported by the residents and also by housing advisors as a result of their monthly visits. Finally, MAHP staff sometimes found problems when they made inspections for specific issues. For example, before the 2008 hurricane season PBS&J inspectors conducted "Adverse Weather Inspections" of each occupied unit to ensure that the units were stable, straps were tight and covers for windows were available.

Each unit includes a two-year manufacturer's warranty. When warranty items are identified for repair they are referred to the manufacturer's representative for correction. For non-warranty repairs MAHP selected a Mississippi-based contractor to perform maintenance in all counties. It was sometimes difficult to determine whether a

particular problem was a warranty or non-warranty item. Discussions similar to those at the transition site were necessary to determine the cause and responsibility for a problem. For example, a faulty part was generally a warranty item, while parts incorrectly installed or damaged after installation were non-warranty items.

The program expects residents to take some responsibility for maintenance. Occupants are responsible for reporting maintenance issues promptly and keeping the unit in reasonably clean condition, in addition to addressing routine, minor maintenance needs, such as replacing a light bulb or air conditioning filter. This level of responsibility reportedly was new to some former travel trailer occupants, because FEMA provided all maintenance, including something as simple as light bulb changes.

Prior to establishing a contract with a maintenance contractor in fall 2007, program participants called the MAHP call center with maintenance concerns. Once the maintenance contract was in place, maintenance calls were routed directly to the maintenance contractor's call center. This step reportedly improved responsiveness because the contractor's customer service representatives were better trained to ask probing questions that clarified the nature of the problem. For example, if a tenant calls in to report a "leaking" toilet an experienced customer service representative can clarify whether the toilet is actually "leaking" (an emergency) or "running" (a non-emergency).

The MAHP standards for response times are within two hours for emergency repairs and within three days for more routine maintenance. Independent contractors hired by MEMA confirm that work has been completed. Some confirmations are made by phone, but MAHP staff reported that most are confirmed through visual inspections.

## Quality of Life

A formal survey of families that have occupied Cottages for at least six months will be conducted in the fall of 2008. The findings from the survey will provide a more in-depth assessment of quality of life issues, which will be included in the interim report scheduled for delivery early in 2009. Until that time, information from discussions with key stakeholders—including participants themselves, MEMA staff and contractors, local government representatives and non-profit organizations—can provide a preview of participant perceptions.

There appears to be a clear consensus that the Cottages are a far better solution for long-term temporary housing than trailers. The additional living space, full-size kitchens and bathrooms, higher ceilings, more light from windows and the outside space on the porch were reported to contribute substantially to the occupants' sense of well being.

Housing advisors reported that bathroom and kitchen features were particularly valued, as was the additional storage space. Improvements to mental health were mentioned by occupants more frequently than physical health; living in a unit that

"feels more like a home" was important. Being able to resume valued pre-storm activities created a sense of normality that was not available in the trailers. Simple activities, such as hosting a family occasion or a bridge club meeting or taking a bath, were mentioned. Having an accessible unit meant a great deal to occupants with mobility issues. For example, one applicant had not been able to leave the trailer under her own power for two years. Being able to sit on the porch of her Cottage and watch her grandchildren play was a thrill, despite the fact that her limitations remained significant. Another elderly couple praised the accessible bathroom and shower that were much more accommodating to the husband's mobility impairments than the FEMA travel trailer.

### Participant Perceptions of Cottage Life November 2007

"This is the first time since the storm that I've been able to invite my family to my place."

"I'm a Vietnam veteran. In the FEMA trailer I started having nightmares again. It was so claustrophobic. But in the Cottage I feel like I can breathe."

"I don't understand how they expect me and my (grown) daughter to live in a one-bedroom unit."

"It's has an actual, full size stove. A turkey fits in the oven!"

"I can turn around in the bathroom."

"I feel a little more normal—it feels more like a home."

"I have a bathtub! I can take a bath again!"

Not everyone was happy, especially two-, three-, and four-person households that received the one-bedroom Park Models under the early, more stringent policies that

mimicked a disaster response scenario. These families did not have the same expectations for living space that they might have immediately after the disaster. In addition, Park Model units also had some chronic problems with air conditioners that affected occupant satisfaction and housing advisors reported some dissatisfaction with the responsiveness on repairs to manufacturer warranty items on all unit types.

Receiving a Cottage and knowing that it was available through March 2009 reduced stress for some participants, especially as FEMA increased its emphasis on removing trailers. However, anxiety has increased for some households without permanent housing plans because the family is unable to feel secure and settled in the unit. Many of these families express frustration about the lack of information about whether and at what price the Cottages will be available for sale. Empathizing with occupants, housing advisors share the frustration of repeatedly being unable to answer questions about permanency. These issues are discussed further in Chapter Three.

By the end of August 2008, MAHP had occupied 2,806 Park Models and Mississippi Cottages, and temporary placements were winding down. Chapter Three reviews MAHP's transition to permanent housing, which officially got underway in April 2008.



# Chapter Three:

## Transitioning to Permanent Housing

This chapter describes MAHP's shift in focus from temporary installations to the demobilization of units, including the development of permanent housing. It reviews the policy issues encountered and the organizational changes caused by the transition. It also describes the attitudes and reactions of program participants, as well as the communities that were affected by the proposed demobilization activities and the looming March 2009 deadline. Because Mississippi was in the midst of this transition when this case study was written, this account covers only a portion of the permanent housing story. A progress update will be provided in the 2009 interim evaluation report.

Mississippi's proposal included the potential for converting the Cottages from temporary to permanent housing by installing units on permanent foundations. The State also anticipated that a small percentage of Cottages would bypass temporary installation entirely and be sited in permanent housing developments, which MAHP called "community-driven special projects." MAHP anticipated these Cottages would be incorporated into multi-family rental developments.<sup>9</sup>

MAHP also expected that local government and community organizations would be eager to partner on the permanent housing projects. Instead, MAHP experienced a general resistance to the Cottages from local governments and an especially negative reaction to the concept of developing group sites. As a result, MAHP emphasized the temporary nature of the units in the beginning of the program in order to make it clear that MEMA was committed to demobilizing all of the units by March 2009 unless the jurisdictions themselves authorized an alternative approach.

To more actively and publicly pursue permanent housing options at the same time would have undermined that important message. Referring to potential permanent housing developments as “special projects” helped mitigate this dilemma.

Despite the challenges, work on a handful of permanent housing projects did begin early on. For example, MAHP worked with staff from the City of Pascagoula to develop a 100-unit project. However, late in the planning process the Pascagoula City Council refused to support the project. Similarly, MAHP offered Cottages to the Biloxi Housing Authority (BHA) for use on land that BHA already owned, but BHA did not have the funds needed for site and infrastructure improvements. The extent of MAHP’s communication and outreach efforts with community organizations in the early months is less well documented than their outreach to local governments. Initial discussions with public or private partners looked promising at the outset, but none were brought to closure.

## Organizational Changes

MEMA and PBS&J recognized that new expertise was needed for disposition, permanent housing issues and demobilization. When MEMA drafted the RFP to competitively procure the project management role in 2008, a new emphasis was placed on permanent housing. In response to the RFP, PBS&J added strategic planning and

housing development policy expertise to their team by subcontracting with the Hagerty Consulting Group.

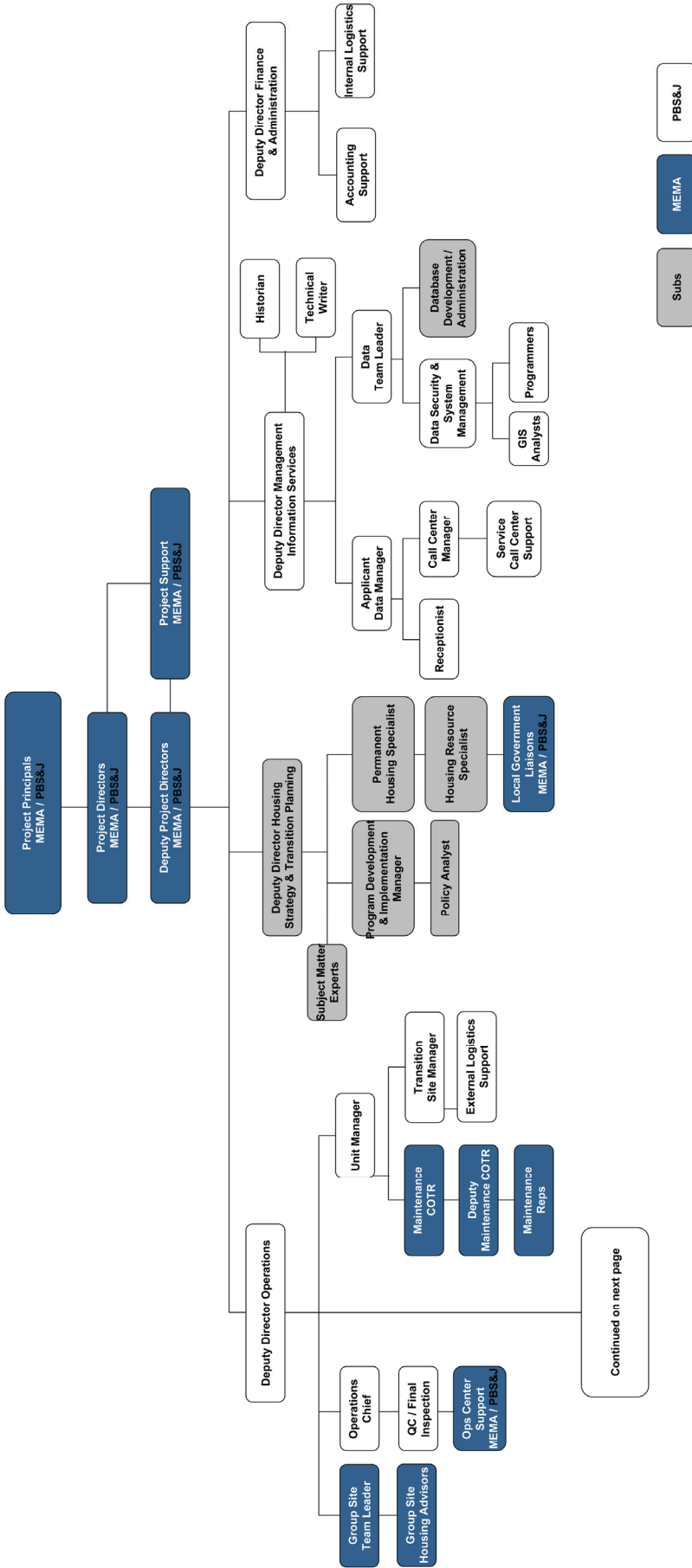
Along with the addition of Hagerty staff, other organizational changes occurred in late 2007 and early 2008. As a result of the shift to permanent installations, a number of PBS&J operations staff were removed from the project as the volume of temporary installations declined. PBS&J management assigned operations staff to other short-term projects to enable them to return to MAHP when demobilization began. This strategy will enable the program to maximize previous training and experience. Unrelated to the shift to permanent housing, MAHP experienced leadership transitions on both the MEMA and PBS&J sides of the organization. Both project directors left the organization and deputy project managers stepped into these roles. Exhibit 3-1 shows the most recent organizational chart (June 2008).

## Disposition Planning and Challenges

### An Official Start

Minimal attention was given to planning for the transition to permanent housing until early 2008. In addition to local government resistance, another reason was that the organizational start-up and temporary housing activities alone were an ambitious undertaking for the first nine months of

Exhibit 3-1: MAHP Organizational Chart June 2008



Continued on next page

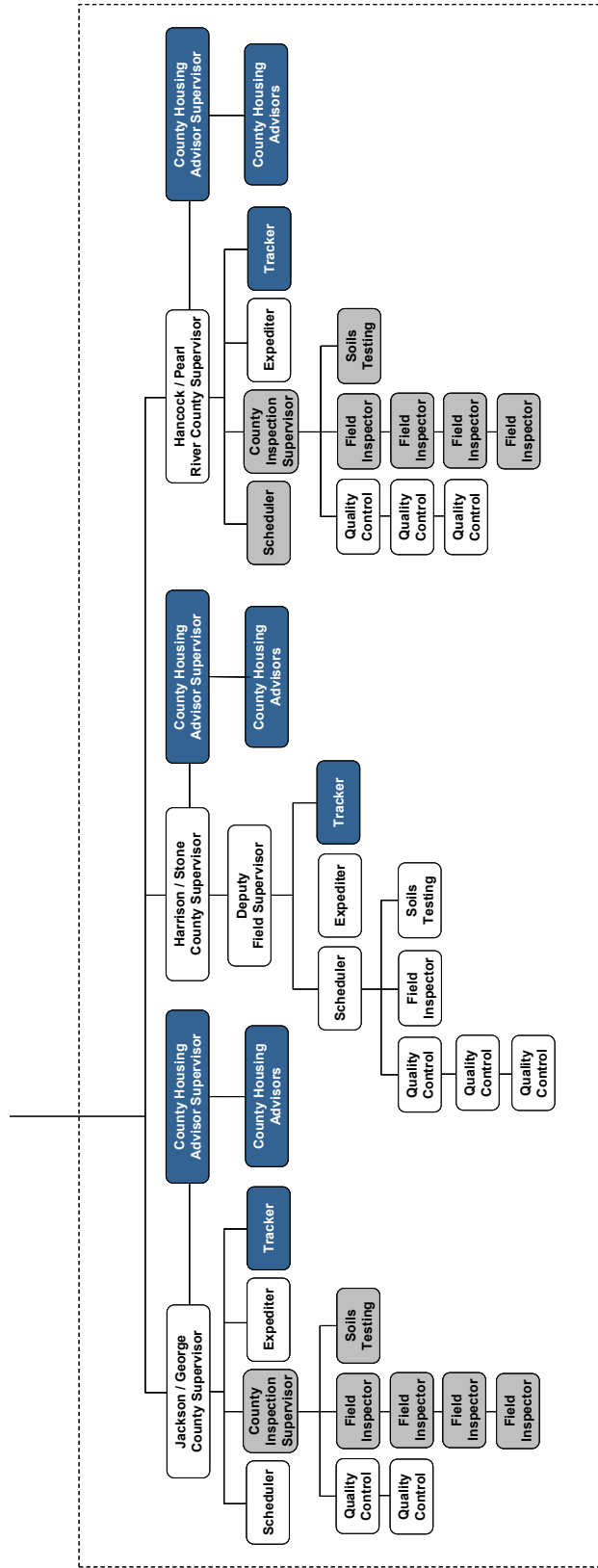
Subs

MEMA

PBS&J

Updated June 25, 2008

Exhibit 3-1: MAHP Organizational Chart June 2008 (continued)



operations. Mississippi identified April 1, 2008 as the official start of MAHP's permanent housing program, although some planning efforts were underway by January 2008. For example, during the first quarter of 2008, engineering specifications were developed for the permanent foundations on which Mississippi Cottages and Park Models would be placed. Installation design and procedures were two of many issues that had to be revisited with permanent housing in mind. MEMA also worked with the state legislature to amend a statute that allowed MEMA to sell, transfer or lease units to non-profit organizations.

In much the same way as they had done with the temporary program months earlier, MAHP now had to establish disposition policies and procedures for the permanent program including: (1) who was eligible to receive a Cottage, and under what type of ownership or long-term rental arrangement; (2) how the units would be transferred to eligible households or other owners; and (3) how units would have to be installed to receive approval from local governments. New issues arose as well, such as what to do with units that were not destined to become permanent housing and what steps MAHP could take to ensure that some or all of the Cottages continued to be used for affordable housing after the grant period ended.

When PBS&J's new contract began on April 1, the new subcontractor, Hagerty Consulting, began to develop recommendations for permanent housing policies and procedures. Designing this disposition strategy was made more difficult by a lack of reliable and updated

information on the MAHP participants. Early in the temporary housing phase, MAHP relied on FEMA data to identify potential participants and only collected additional information if it was required to complete the approval and move-in processes. Once the units were occupied, housing advisors conducted monthly visits and completed a brief survey with each household, but the information collected was limited and was not entered into the MAHP database for analysis.

The largest information gap was that MAHP did not have current income information to determine what types of permanent housing resources participants could afford. This is one of several areas, discussed later in this chapter, in which MEMA's lack of permanent housing expertise and focus on temporary housing was a hindrance to the permanent program.

## The Disposition Plan

Before the permanent housing phase began in April 2008, MAHP identified the primary disposition options, but the details of how each option might be implemented were not yet settled. The options available for disposition were to:

1. Sell the units to current occupants for permanent housing.
2. Sell or donate the units to eligible organizations who would establish the units as affordable rentals or assist families to achieve homeownership.
3. Transfer ownership of the units to federal, state or local government entities.

4. Auction the units through the State's normal procurement and disposition process.

The issues and barriers that had to be addressed in order to execute these options are discussed below.

### **Compliance with Flood Plain Requirements**

Permanent placement of units requires compliance with flood plain management requirements. These rules affect both where and how the Cottages can be permanently placed.

#### ***V-Zone Restrictions***

During the temporary housing phase, approximately 300 Cottages had replaced FEMA trailers in Coastal High Hazard Areas known as Velocity-Zones, commonly called VE or V-Zones. V-Zones are areas where the wave velocity is the greatest and typically include the first row of beachfront properties. MAHP's grant agreement with FEMA prohibits permanent installation of Cottages in these areas. This means that all units placed temporarily in these areas will have to be demobilized. Some of the households living in these Cottages will have finished rebuilding their homes by the March 2009 deadline, but others will have to seek alternative housing or find a suitable site outside the V-Zone on which to place the Cottages.

#### ***Elevation Requirements***

To obtain flood insurance in flood hazard areas, occupants may be required to elevate

units to heights established by the National Flood Insurance Program (NFIP). Some elevation requirements were changed by the federal government as a result of Hurricane Katrina and the specified heights vary substantially along the coast. Because some households had rebuilt before the new requirements were established, some beachfront communities have dwellings elevated to varying heights. Locals call this variation the "fishing camp" look. Exhibit 3-2 shows an elevated home next to a Cottage.



**Exhibit 3-2: Elevation requirements vary along the Mississippi Gulf Coast. Elevated home in Waveland, MS; July 2008.**

The 2003 International Residential Code (IRC) specifies that the Cottage elevations may not exceed 5'7". In some areas elevation requirements far exceed this limit. Therefore, an additional number of participants may be unable to permanently install their temporary Cottage, even if they own the land.

Cost of the elevations is also a feasibility issue. MAHP has estimated that permanent installations without elevation will cost \$20,000 per unit, while installation with elevations up to 5'7" could cost an additional \$10,000 per unit. MAHP allocated \$15

million of the AHPP funds for permanent installations, which is estimated to be enough to install approximately 500 units. Although the hope is that partner organizations can bring additional funding to the table to cover some of these costs, it is possible that a portion of the cost will need to be passed on to the MAHP participant purchasing the unit. This could make purchasing less feasible for some participants.

### **Community Approvals for Permanent Housing**

Obtaining local jurisdiction approvals for permanent housing is both a technical and a political challenge. Each participant wishing to convert a Cottage to permanent housing has to comply with local zoning and code requirements. For example, units will have to be placed on permanent foundations and the above-ground utility lines that were acceptable for temporary housing will not be permitted long-term. Some units will have to be placed in different locations on the site to meet local “set-back” requirements that were waived for temporary housing. In cases where temporary Cottages sat in front of damaged homes, owners must to decide which unit to keep because in some jurisdictions two structures cannot remain permanently on the same lot.

Despite the fact that the Cottages were built to meet modular housing standards, several jurisdictions have 1,000 square foot minimum requirement for residential units. This requirement alone disqualifies both the Park

Model and the Cottages in those jurisdictions. One MAHP partner, Habitat for Humanity Bay Waveland, pursued options for adding on to the Cottages and worked with a manufacturer and MAHP to create specifications. Four prototype units with additions are being constructed in Diamondhead (a small unincorporated area of Hancock County). Two were installed and ready for occupancy by the end of August 2008. Exhibit 3-3 shows Cottages with additions. MAHP and potential partners will use this pilot to demonstrate to other local communities what the units could look like with the addition. As one government representative said, “Mississippi is kind of a ‘show me’ state where plans and talk only go so far.” Several MAHP staff and non-profit partners believe that once permanent options for the Cottage are demonstrated, others in the community will come around.

In general, the idea of cottages as permanent housing is less controversial in the three northern counties and more contentious in the coastal counties, particularly in incorporated areas. The northern counties are predominantly unincorporated and have fewer zoning, development and flood hazard restrictions than coastal areas. Given the frustrating experience with the MOU process, MAHP decided to approach Pearl River, George and Stone Counties for approvals on a case-by-case basis. Far fewer Cottages were placed in these areas—only 46 units in Pearl River County, a handful in George County, and none at all in Stone County as of the end of August 2008.

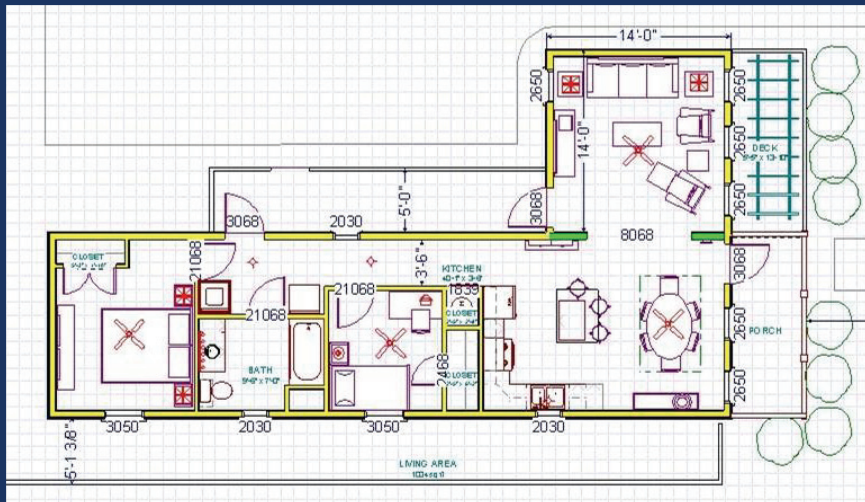


Exhibit 3-3:

Above: Habitat for Humanity of Bay Waveland worked with a manufacturer to design an addition for Cottages and Park Models.

Right: A prototype of an expanded unit.

Below: A floor plan for an expanded cottage.



Among the three coastal counties, permanent placements were approved by unincorporated areas by June 2008. Hancock County approved the units for areas where mobile homes are permitted; Harrison County approved the units in areas zoned for manufactured or modular

homes; and Jackson County approved the units for areas where mobile homes and modular housing is allowed.

However, at the time of this case study, some incorporated jurisdictions (Biloxi, Pass



Christian, Gautier) remain adamant that no Cottages be placed permanently, either in future Cottage developments or on private land. Others recognize that the March 2009 deadline is fast approaching and that many of their residents are still seeking permanent housing. These jurisdictions have begun exploring the ways in which the Cottages might be able play a role in solving the general affordable housing crisis that exists along the coast. They are especially open to solutions that would aid elderly or disabled residents and seem to favor small, permanent developments using the Cottages as opposed to allowing citizens to permanently install Cottages on private property. Ocean City and Gulfport have developed concepts for small, permanent group projects using the Cottages.

Decision-making was not easy for community leaders who heard from constituents on both sides of the issue. In at least one area, the opinions of those who had the ear of local officials were persuasive because local representatives did not have first hand knowledge of MAHP and some had not personally seen the inside of a Cottage. Property owners, especially those who had already gone through the emotional and financial expense of rebuilding, feared the Cottages would reduce the value of their properties. Opinions of some local government representatives and community members were based on perceptions of how “deserving” a family might be. Generally, those who were perceived as deserving were low-income elderly or disabled persons, while households without permanent housing plans that included unemployed

adults were sometimes perceived as looking for a permanent handout.

On the other hand, community organizations and major employers expressed an urgent need for affordable, workforce housing. One local government official expressed a concern that industries may relocate to other areas where housing is more plentiful if the jurisdictions do not solve the housing problem. This could result in further damage to the economy of the region. At one city council meeting a representative of Northrop Grumman reported that the company could fill as many as a thousand vacant positions if the workers had affordable places to live that were closer to Pascagoula. The local newspaper chastised the City for a lack of attention to the needs of its citizens and largest employer, asking, “How long do [officials] think thousands of Northrop Grumman employees now living in Mobile County [Alabama]—because they cannot find a home in Jackson County—are going to keep making such an expensive commute?”<sup>10</sup>

Based upon their experience with FEMA, some jurisdictions were not convinced that the March 2009 demobilization deadline was real and feared the Cottages would remain permanently by default. Others seemed to be assuming that MAHP would extend the deadline for residents who were not finished rebuilding. One mayor stated that when March 2009 arrived, if some citizens still needed their Cottages, the city would be open to a MEMA request for an extension of the deadline. This idea seemed not to take into consideration MEMA’s firm determination not to ask for extensions and to

close down the program by March 31 one way or another.

Both MEMA and the local jurisdictions expressed some concern about what was going to happen at the end of March if residents refused to leave their units. In an attempt to make clear to the jurisdictions just

**“You have to remember that we’re still dealing with desperate people here.”**

**Housing Advisor in July 2008 expressing concerns about the March 2009 demobilization date**

how serious MEMA was about the deadline and to allay jurisdictions’ fears about permanency, the Governor suggested that he would “call out the National Guard” if necessary to retrieve the Cottages. Housing advisors also expressed concerns about the deadline and gave examples of households that might resort to violence to keep their Cottages.

### **Developing a Viable Homeownership Program**

Before the first MAHP unit was temporarily installed, applicants began asking questions about purchasing the Cottages. These inquiries intensified, especially as the March 2009 deadline moved closer and housing advisors reiterated the need to develop permanent housing plans during their monthly visits. MAHP staff report that participants have become increasingly frustrated with the lack of information about a purchase plan. The Advisors, who are greatly invested in resident outcomes, feel some of the same frustration

that residents do, noting it is hard for families to plan for permanent housing when they have no idea if they can afford the Cottage. It is also possible that the absence of a purchase plan has stalled participants from exploring other permanent options because they assume they will be able to purchase the unit.

After analyzing available data, MAHP recognized that it needed more information to inform the development of a Cottage purchase program. In June 2008, MAHP undertook a participant survey, called the Permanent Housing Survey, which will include approximately 2,800 responses when it is complete. The survey asked for basic demographic information and included questions about resident interest in purchasing a Cottage, how much they felt they could afford to pay for housing costs (rent or mortgage payment, utilities, insurance and taxes) and whether the occupant had access to a site on which to place the unit permanently. MAHP knew that 63 percent of the temporary units were placed on private sites that participants did not own, sometimes in a friend’s or relative’s yard or on land available for lease from others. This arrangement makes it likely that many of these sites might not be available or appropriate for permanent housing. The survey was implemented by housing advisors in June 2008 and is expected to be complete in fall 2008.

The preliminary results, including 1,166 pre-disaster homeowners and 636 pre-disaster renters, indicate that 72 percent of owners and 92 percent of renters are interested in purchasing their Cottages. Just over half of the pre-disaster homeowners believe they are

financially prepared to purchase the unit, while only a third of pre-disaster renters feel financially ready for ownership. However, even these more conservative estimates may be unrealistic. About three-quarters of both groups indicated they could afford to pay between \$0–\$400 per month in mortgage, utilities, taxes and insurance. Based upon MAHP’s preliminary assessment that \$250–\$400 is the threshold for ownership expenses other than purchase price—that is for maintenance, taxes, insurance and utilities—it appears that a significant number of the interested occupants will not be able to afford a Cottage even if it were provided at no cost. Considering the self-described purchasing power of the target audience, the ownership disposition option presents a number of policy and implementation challenges described below.

### ***Affordability and Pricing***

MAHP is seeking a pricing strategy that supports the preservation of the Cottages as affordable housing over an extended period. Even if a household can afford the initial purchase price, the ongoing costs of insurance, taxes and utilities could present a burden. MAHP requires anyone who purchases a unit to maintain homeowner/hazard insurance on the unit and, if required, flood insurance. As a result, MAHP is considering an income-based pricing structure that also considers unit condition. A standard exception was also added to make the units more affordable for elderly and disabled households. The proposed, draft pricing structure is displayed in Exhibit 3-4.

### ***Financing***

MAHP is anticipating that participants with low incomes and those with poor credit scores

**Exhibit 3-4 Draft Pricing Structure for Cottages**

<b>Percent of Median Household Income (\$34,473)</b>	<b>Affordability Discount</b>	<b>Price of New Park Model</b>	<b>Price of New 2-Bedroom Mississippi Cottage</b>	<b>Price of New 3-Bedroom Mississippi Cottage</b>
200% +	0%	\$12,347	\$22,699	\$26,191
115% - 200%	35%	\$8,026	\$14,754	\$17,024
80% - 115%	50%	\$6,174	\$11,350	\$13,096
50% - 80%	75%	\$3,087	\$5,675	\$6,548
At or below 50% (or disabled or senior citizen)	95%	\$617	\$1,135	\$1,310

will find it challenging to secure financing because both mobile home and traditional mortgages lenders require acceptable credit scores. In addition, lenders may have minimum required loan amounts for their existing products and be uninterested in changing policies for the relatively small purchase amounts anticipated.

In July 2008, MAHP convened a lender forum to explain the program to area banks, lenders and brokers and to get feedback on potential barriers. The lenders indicated they would be willing to finance units installed on permanent foundations and suggested that MEMA have the Cottage appraised to determine the unit value. They also gave suggestions for notifying participants about the purchase program and encouraging them to begin preparing for ownership. Lenders noted that helping households under \$25,000 in annual income achieve ownership will be difficult. One lender described a promising loan product that finances site preparation, infrastructure and installation on a permanent foundation in addition to the housing unit itself.

An additional issue that makes financing even more complex is the distinction between real and personal property under State guidelines for mobile and manufactured housing. Whether mobile homes are considered personal property or real property is generally a matter of State law, and, in Mississippi, an owner has the option of classifying a mobile home as real or personal property upon registration. Manufactured housing that is permanently affixed to land is generally considered real property. It

appears that the Cottages could be considered in either category. They arrived on wheels and initially were installed in a manner similar to a mobile home, but they meet IRC standards and can be affixed to a permanent foundation.

Each option offers advantages and disadvantages. If the Cottages are considered real property, traditional mortgage lending products can be used. If the Cottages are considered personal property, traditional mortgage instruments could not be used for such sales and typical personal property instruments (such as those used for mobile homes) would need to be used. Considering the Cottages as real property would result in higher closing costs than a personal property transaction. In addition, if Cottages are sold as real property, the owner pays annual property taxes, a possible disincentive for program participants, but a possible selling point for local jurisdictions. (However, several government representatives made it clear that their preference is for residents to build larger, and in their view higher quality, units that would generate more property tax revenue than the Cottages.)

Over time this classification may also affect the value of the Cottage. Typically, well maintained real estate retains its value and sometimes appreciates. Rapid depreciation is the norm for personal property. It is not clear whether the Cottages will appreciate or depreciate in value over time, but some MAHP staff and local government officials suggested that it is conceivable that a properly installed Cottage with an expected lifespan of 30 years could appreciate.

### ***Applicant Communication and Counseling***

MAHP recognizes that participants will require financial and homeownership counseling beyond what the housing advisors are able to provide. PBS&J's re-bid proposal for program management included Enterprise Corporation of the Delta (ECD), a non-profit subcontractor to be responsible for facilitating MAHP participants' transitions to permanent housing, particularly with respect to homeownership and financial counseling. However, ECD and PBS&J could not agree on contract terms and ECD decided not to participate in the program.

In early August 2008, PBS&J began negotiating a partnership with International Relief and Development's (IRD) Gulf Coast Community Service Center to provide financial and homeownership counseling for MAHP participants interested in ownership. IRD has been providing emergency relief and long-term recovery services along the Mississippi coast since the 2005 storms and had a presence in the region before Katrina. The organization has a resource center in each county, offers lending products and has an online housing counselor program. PBS&J's project manager said that, in retrospect, they should have been better informed about available local resources such as Gulf Coast Housing Resource Centers at the time of the re-bid.

The expected timeline for Cottage purchases is also an issue. For many families, preparation for homeownership can be a lengthy process. Some need months or even years to repair credit, collect savings and find workable

financing. The March 2009 deadline will not be compatible with the needs of such families.

### **Donation or Sale to Third Party for Affordable Housing Development**

Donating new and refurbished Cottages to non-profit housing and development organizations may offer a way to maintain affordable rental housing or create additional homeownership opportunities along the coast. A renewed interest in acquiring Cottages among community organizations surfaced in the beginning of 2008. This interest was likely encouraged by the Mississippi Development Authority's reallocation of \$241 million in Community Development Block Grant funding from the Homeowner Assistance Grant Program to the Long Term Workforce Housing Program (LTWHP). The first round of funding was announced in September 2007, a second in April 2008 and a third round is expected in fall 2008. Defined as housing benefiting households with incomes at or below 120 percent of the Area Median Income, the LTWHP is designed to provide grants and loans to local government, and non-profit and for-profit organizations to help develop long-term affordable housing.

In July 2008, MAHP initiated a Letter of Interest (LOI) application process for community organizations that are ready to propose specific projects. The LOI will act as a starting point for negotiations between MAHP and the organizations. Prior to this formal process, MAHP, MEMA and the Governor's Office committed Cottages and MAHP installation funding to two organizations that expressed early interest in the units. Just over

200 new Cottages were committed to the two partners. Other partners will receive remaining new Cottages and refurbished Cottages as they are demobilized.

The donation and sale options to non-profits raise three related policy concerns discussed below.

### ***Planning for Permanent Developments***

Until IRD begins providing financial and homeownership counseling, it will be unclear how many households who want to purchase their unit are actually able to do so, and, therefore, how many and what type of units will be available to partners for permanent developments. Moreover, MAHP is unable to provide anything more than an estimated timeline for when the partners may receive refurbished units—mostly likely November 2008 to March 2009—since the volume and pace of demobilization is unknown. These constraints make it difficult for partners to plan and suggest that MAHP will need to work very closely with prospective organizations.

### ***Sustainability of the Cottages as Affordable Housing***

MAHP will monitor the Cottages to ensure they are used for affordable housing purposes and that the uses conform to the MAHP grant agreement until the end of the AHPP grant in 2011. MAHP is investigating options for sustaining affordability past the grant term, including restrictions in formal agreements with community organizations and requirements for deed or title restrictions.

### ***Minimizing Profiteering***

Several of the non-profit organizations that have expressed interest in the Cottages have partnered with private, for-profit organizations to access development capacity and leverage funding. MAHP wants to put mechanisms in place to prevent excessive profits to for-profit entities once the MAHP grant closes out in 2011. MAHP also intends to ensure that donation policies address limits on how the nonprofits can use Cottages and the terms under which they could be sold after the grant expires.

### **Transfer to Government**

Transferring the Cottages to another federal, state or local government is not a preferred option for MAHP, unless the transfer is for a permanent housing activity or immediate use in another disaster area. It would be possible for a government entity to store units to be used as temporary housing for the next disaster, but, to date, this option has not received much interest.

### **Sale at Auction**

Although possibly the easiest solution to implement, selling the Cottages at auction is the least desirable disposition approach because it is unlikely to result in an increase in the availability of affordable housing. Several MAHP staff said that a widespread sale of Cottages for guest houses, hunting cabins or other secondary uses would be the worst possible outcome of the permanent housing phase. At the same time, the quality of the Cottages has generated great interest in

these uses among MAHP participants who are rebuilding homes and other coastal residents. MAHP will auction units that are in poor condition and units that do not become permanent housing at the end of the program in “as is” condition. It is unclear how many units will be returned in poor condition or otherwise sold at auction, but MAHP is anticipating a small number.



**Exhibit 3-5: A Cottage in a mobile home park in Gautier, July 2008. MAHP has placed 323 Cottages in commercial mobile home parks. MRHA will take ownership of these units on a rolling basis through 2009 and pair them with Housing Choice Vouchers for income-eligible families.**

## **Progress on Special Projects and Disposition Activities**

MAHP has had some success in moving permanent housing projects forward. Interest and planning for such projects rapidly accelerated in April 2008. This section offers a description of potential partnerships, as well as projects already under development.

### **Mississippi Regional Housing Authority**

One of MAHP’s most promising partners is the Mississippi Regional Housing Authority

(MRHA). MRHA manages 1,200 public housing units and 5,672 Housing Choice Vouchers (HCV) in Mississippi’s 14 southern counties. Katrina’s devastating impact on the availability of affordable rental stock made it impossible for MRHA to use its full HCV budget authority. After the storms, Congress allowed Gulf Coast public housing authorities to use excess HCV budget authority for other housing related projects. MRHA contributed a large portion of the excess to Low-Income Housing Tax Credit development activities that the organization undertook to build new affordable housing in the region.

In December 2007, HCV funds previously obligated by MRHA to other housing authorities were freed-up. (Under voucher portability procedures families may be assisted in another jurisdiction. The PHA at the “receiving” jurisdiction can bill MRHA for the amount of the subsidy. December was MRHA’s deadline for fulfilling these outstanding obligations.) This change enabled MRHA to partner more actively with MAHP. The partnership could be beneficial for both parties since MAHP has units and a supply of low-income tenants and MRHA has rental subsidies that could not otherwise be used because of the shortage of rental housing.

MAHP and MRHA are partnering on three permanent housing efforts to date. First, MAHP is transitioning all 323 Mississippi Cottages in commercial mobile home parks to the South Mississippi Development Corporation (SMDC), a nonprofit subsidiary of MRHA. SMDC will own the units and lease the pads from park owners. Exhibit 3-5 shows a Cottage sited in a mobile home park.

MRHA will offer Housing Choice Vouchers to current commercial park occupants who are eligible for the program. When vacancies occur, SMDC will offer the units first to other MAHP participants and then to other low-income households. MAHP staff is helping participants living in commercial parks to apply for the Housing Choice Voucher program. Those who are not eligible or are not interested in participating in the program can remain in their current unit and will be charged market rent when their MAHP lease expires in 2009.

MRHA has also proposed three new permanent developments using 227 new and refurbished Cottages. MAHP has agreed to provide \$4.4 million in installation and infrastructure funding for the developments, which SMDC will own and manage as rental housing. The units will be available to families that have Housing Choice Vouchers and also to market-rate renters. Two developments will be located in unincorporated areas of Harrison County; the third will be a 27-unit senior village in Gulfport.

Lastly, MRHA (through SMDC) has offered to take ownership of and manage the 80 units of Eco Cottages that are expected to be sited in Picayune, Mississippi. An architecture firm was hired in December 2007 to complete the technical design for the Eco Cottage. Revisions to the floor plan to make the units more cost effective to construct were underway as of August 2008. Paralleling the design process, MAHP identified a suitable parcel on which to place a community of 80 Eco Cottages in Picayune. A long-term lease was signed with the owner of the property,

and the project is moving its way through the county approval process.

## Other Partnerships

Habitat for Humanity Bay Waveland is currently installing four prototype Cottages with additions in Diamondhead (Hancock County). The first two units were completed in preparation for the third anniversary of Katrina. For these units, the organization worked with Lexington Homes, one of the Cottage manufacturers, to design an addition to be used with MAHP Cottages. Exhibit 3-3 shows a completed Cottage with an addition and a floor plan for the unit. The organization also received the jurisdiction's approval for 40 units of infill development using Cottages with the expanded square footage.

In July 2008, the City Council of Pascagoula agreed to negotiate with MAHP for three permanent Cottage installations. The city approved: (1) the installation of 6-8 Cottages to be used as housing for two years and then as commercial space for small shops; (2) five cottages with expanded square footage to be owned by Habitat for Humanity Mississippi Gulf Coast and sited on infill lots within the city, and (3) 15 Cottages with expanded square footage developed by the Gulf Coast Community Foundation.

Enterprise Community Partners will develop the Ocean Springs Cottage Village, which will be a mixed-used development containing 8 Park Models.

The Renaissance Development Corporation requested 40 units for a Cottage development in



Hancock County. The units will include additional square footage. Overall, Renaissance hopes to provide permanent placements for all 200 to 300 Cottages that are temporarily installed in V-Zones.

MAHP's disposition program is now taking shape. It is too soon to tell how successful interested MAHP participants will be at purchasing their units for permanent housing or how well the partnerships with local governments and nonprofits will meet the needs of low-income renters and special populations. An update on these issues will be presented in future reports. Chapter Four reviews building sciences assessments to date, while additional observations about the permanent program and lessons learned are discussed in Chapter Five.



# Chapter Four: Preliminary Results of the Building Sciences Evaluation<sup>1</sup>

## Introduction

The Building Sciences component of the AHPP evaluation will assess the performance of the MAHP units. This is critical since housing that is durable, affordable and energy efficient will best serve the needs of MAHP participants and the larger community. Durability and energy efficiency are particularly relevant as the “life cycle” costs are ultimately borne by the owner, typically well after the initial influx of post disaster financial assistance. The building sciences evaluation includes: a review and assessment of the unit designs, unit production processes, and delivery and installation of the homes; short-term and long-term durability assessments; and performance assessments following severe weather events, such as Hurricane Gustav in September 2008.

This chapter summarizes the building sciences evaluation activities and preliminary results for the MAHP. As of September 2008, the Park Model and Mississippi Cottages have undergone a number of building sciences evaluation tasks, including:

- A design review;

---

<sup>1</sup> The chapter was authored by Dana Bres of HUD’s Office of Policy Development and Research. It is based on building sciences evaluation activities completed by the National Association of Home Builders (NAHB) Research Center. While the rest of the report covers implementation activities through August 2008, this chapter includes building sciences observations through early September 2008 to capture unit performance during Hurricane Gustav, which made landfall on September 1, 2008.

- Observational monitoring in the housing factories; and
- Several building sciences field tests, such as installation observations, blower door tests to estimate building air tightness and an initial durability assessment to measure the units' post-disaster performance following Hurricane Gustav.

## Unit Design

MEMA's approach was to design a single-wide, manufactured unit, to be produced in one-, two- and three-bedroom sizes. More than one-fifth of the two- and three-bedroom units were designed to be compliant with the Uniform Federal Accessibility Standards (UFAS). MEMA also designed an "Eco Cottage" to demonstrate an environmentally friendly, efficient and attractive design that effectively blends building sciences technology and design. The Eco Cottage is yet to be produced and is not addressed in this document.

The goal of MAHP was to produce units that could be manufactured and installed quickly for temporary housing, yet also would be suitable as permanent housing. For this reason, MAHP units were designed to meet both the current HUD code for manufactured housing and the International Residential Code (IRC), which is the model building code for new construction of units most commonly adopted by states, cities and counties in the United States. In terms of building performance, neither code confers a specific advantage, as both establish a minimum

standard and the MAHP units were designed to exceed those minimums.

## Structural Design

The final specifications for Park Models and Cottages met or exceeded the requirements of the HUD code and the International Residential Code in several areas that directly affect the strength of the units.

The units were designed to resist the more stringent IRC standard of 150 miles per hour wind speed. Under the IRC, there are two standards for the coastal areas of Mississippi, and the selection of the 150 miles per hour standard allowed the MEMA units to be placed anywhere temporarily.

The metal roofing selected for the Cottages provides both additional durability and structural strength by using a "hip roof" configuration. A hip roof slopes to all sides of the home and does not have gables. Hip roofs are stronger than traditional gable roofs, as the structural components of the roof are better aligned to resist wind loads. (Neither the HUD code nor IRC require a specific type of roofing.)

The siding MEMA selected for the Cottages is a fiber cement product that has demonstrated excellent impact, wind and insect resistance, as well as outstanding durability. The performance of fiber cement siding provides greater durability than wood siding in event of storms, as well as for routine maintenance. Because fiber cement does not absorb moisture (as wood siding does), paint applied to such siding will last significantly longer.

## Interior Space

As described in Chapter One, five core models were produced: a one-bedroom (Park Model) at 396 square feet, two- and three-bedroom Cottages, and two- and three-bedroom UFAS-compliant Cottages. The UFAS models are variants of the standard two- and three-bedroom units, which total 728 and 840 square feet each. As with many manufactured homes, production of multiple units provided an opportunity to refine and perfect the interior design and use of space.

## Aesthetic Design

MEMA was very deliberate in the designs they selected for the MAHP units. The architectural vernacular of the Cottages lends itself to acceptance at the local level. Many traditional style homes in the coastal South are built in the “shotgun” style and include a front porch. The standing seam metal roof of the Cottages continues this traditional design, as do the variety of bright paint colors chosen for the exteriors. As a result, the Cottages blend with the community, a stark difference from the visual impact of the plain white FEMA travel trailers and many manufactured housing units.

## Design Approval Process

The initial Mississippi grant application included unit design concepts that were refined following grant award. In Mississippi, modular home designs are reviewed and approved by the State Fire Marshal. Following development of the designs and their acceptance by the MAHP project staff, they were approved by the project’s professional engineers and submitted for review by the Fire Marshal (for the IRC) and

to the Design and Approval Primary Inspection Agency (DAPIA) (for HUD code compliance). Production design reviews and approvals were conducted on-site by the Fire Marshal and the HUD code In Plant Inspection Agency (IPIA). FEMA involvement in the design process was focused on compliance with structural engineering principles associated with the foundation designs. FEMA’s Mitigation Division performed plan review and provided comments. With the exception of accessibility features in UFAS-compliant units, FEMA did not approve or disapprove of the plans. The MAHP project team also conducted design reviews during the initial development of the construction contracts and production of the housing units.

## Evaluation of Unit Designs

At the beginning of the overall evaluation effort, HUD and FEMA collaboratively selected the building sciences evaluation activities and criteria. These were selected to prevent foreseeable design failures, to predict unit energy usage and to estimate the labor effort required to produce and install the units. Certain results of the evaluation were communicated to FEMA and by FEMA to MEMA immediately. This was an operational decision based on the need for the housing units to succeed. FEMA identified and communicated to the grantee any identified design or construction flaw that might jeopardize the viability of the units.

Evaluation of the MAHP unit designs involved different types of reviews. The building sciences evaluation team reviewed the unit designs and modeled the expected energy

performance of the units as a first step in a complete energy assessment, which will eventually include an evaluation of actual energy consumption. The models predicted that MAHP units will be close to satisfying EnergyStar requirements.

As part of a complete durability assessment the building sciences evaluator reviewed Cottage designs using HUD's "Durability by Design" guidelines<sup>11</sup> and offered an initial durability assessment. As part of this effort, evaluators provided a "best practices" moisture assessment of the design and provided feedback to help MAHP avoid preventable moisture problems. The evaluator also placed moisture sensors in a small sample of units. Based on reviews of the unit designs, observed construction processes, and the materials used in the units, it is not expected that these monitors will detect moisture problems, but the results are forthcoming. The initial durability assessment also incorporated estimates for how long the unit will be able to be used if installed as temporary or permanent housing. The building sciences evaluator also summarized design characteristics of the Cottages using FEMA's web-based Joint Housing Assessment Tool, which catalogues manufacturer information for later use.

Similar to the initial durability assessment where evaluators visited housing factories to review construction processes, other tasks required both design review and on-site observations. Evaluators assessed MAHP designs to determine what skills were required to install a unit and observed installation procedures on-site. FEMA experts also evaluated plans for accessible Mississippi

Cottages for compliance and inspected constructed units in-person. Unlike other evaluation components, the UFAS process was an absolute process under which the proposed UFAS-compliant unit was declared acceptable by the FEMA subject matter expert.

## Procurement and Manufacturing

### RFP and Selection Process

MEMA advertised for the construction of the Cottages through a Request for Proposal (RFP) process. Following receipt of proposals, MEMA reviewed the proposals with the intention of making multiple awards that included options to order additional units without further competition.

The ability of the awarded contracts to allow for additional orders streamlined the production of the units. This approach allowed MEMA project staff to allocate additional orders to high-performing manufacturers based on the quality of units delivered and the manufacturer's responsiveness. The manufacturers understood that they were demonstrating their qualifications and capacity for additional unit orders on an ongoing basis.

### Manufacturing

MAHP units were produced in multiple manufacturing plants. Exhibit 4-1 shows the number of units produced by each manufacturer at each location. The proximity of unit production was an important strategy to help minimize the costs of producing and transporting the units to the Gulfport receiving yard.

In addition to IRC and DAPIA compliance reviews, the building sciences evaluation team visited the factories to gather production information, observe construction and install moisture sensors in the floors, walls and ceilings of selected units. These instruments allow moisture in the walls to be measured in a non-invasive manner. The building science evaluation effort also includes collection of cost and schedule information. The results from this collection effort will be included in future evaluation reports.

## Development of Accessible (UFAS) Units

The Uniform Federal Accessibility Standards (UFAS) establish a common set of design standards to accommodate people with mobility impairments in federally funded projects. Since the MAHP is funded with federal grant dollars, UFAS standards required a portion of MAHP units to be UFAS-compliant. FEMA managed the

review and approval of the UFAS compliant units. This was done through design review and on-site inspection. Because FEMA was not in a position to provide design guidance directly to the manufacturers, the review and approval process was iterative. As a result, the deployment of UFAS compliant units was slower than non-compliant units and involved greater costs on the part of the manufacturers.

## Site Development and Installation

The building sciences evaluator reviewed MAHP installation and site preparation specifications and conducted site visits to observe and assess the installation of Park Models and Cottages. MEMA deployed the majority of the units on privately owned lots. A smaller portion of the units were installed in existing commercial trailer parks. At least initially, site development efforts on private land generally were modest, and temporary modifications were performed on the site. After deciding where the unit would be

**Exhibit 4-1: Number of units produced by each manufacturer and production site**

Manufacturer	Production Site	1 BR Park Model	2 BR	3 BR	2 BR UFAS	3 BR UFAS	Total
Forest River	Wakarusa, IN	400					400
Patriot	Alabama	300					300
Patriot	Indiana	200					200
Oak Creek	Lancaster, TX	300					300
Oak Creek	Fort Worth, TX	200					200
Cavalier	Alabama		300	150	100	50	600
Deer Valley	Guin, AL		300	100			400
Lexington	Lexington, MS		400				400
	Total	1400	1000	250	100	50	2800

installed, the location and design of the anchoring, utilities and access were determined. Units placed on individual lots replaced the FEMA travel trailers that were installed immediately following the storm.

MAHP Cottages were connected temporarily to existing utilities. Water, electrical and communications service were easier to install than sewer service because slope was not an issue. MEMA subsequently also installed units in areas along the Gulf that were not serviced by public utilities or septic systems. In these cases, septic services had to be installed before the unit could be placed.

MAHP units were installed temporarily with anchoring systems similar to those typically used for non-permanent installation of manufactured housing. This requires a determination that the soil can bear the weight of the unit, as well as resist pull-out of the anchors. If the soil beneath a unit is too soft (poor bearing capacity) and is not able to withstand the weight of the MAHP unit, the blocks under a unit might “sink” into the soil. Weak soils also may be unable to hold the screw anchors, so they might be pulled out of the ground slightly if the unit is subjected to high winds.

To accomplish both bearing and hold-down, hold-down screw anchors are installed in the ground. The unit is then positioned on the site and jacked up so that the pier foundation blocks can be stacked. A series of concrete block columns is installed to provide the necessary elevation for the unit. Clips along the structure of the unit are connected and the unit is attached to the ground anchors

with galvanized metal strapping. A ratcheting wheel is tightened, tensioning the metal strapping and firmly anchoring the unit to the ground.

Unit plumbing is attached, and sewer piping is extended to an available sewer connection. Because the Cottages have been installed as a temporary housing, the waste lines are installed above the ground. While this has served to expedite the installation process, it does not present a visual sense of permanency.

The temporary installation strategies selected for the MAHP units, may have contributed to the sense that these units were quite similar to the travel trailers and mobile homes that the Cottages replaced. The visibility of the wheels and piping suggested that the units were yet another round of temporary housing—a visible contradiction to the goal of advancing individual and community recovery.

In addition, the accessible ramps examined by the building sciences evaluators were not impressively crafted. This rough construction generally was on the edge of compliance, with anecdotal reports of ramps on similar units (non-MAHP) being built and rebuilt until compliance was achieved. In the case of the MAHP units, while the ramps may have been serviceable, they were not particularly durable.

Building sciences observations also included reports of the plywood panels for hurricane protection being discarded. Those actions might result in damage to the building



envelope as the panels were integral to the storm protection of the units.

These observations suggest a need for a reconsideration of the systemic issues of the installation. Planning for the installation process may not have been as detailed as the planning for the construction and receipt phases. Installation problems likely did not impact the overall longevity of the units, as the unit design and construction resulted in units with significant structural strength and potential durability.

## Ventilation and Air Quality Testing

In conjunction with the Federation of American Scientists, MEMA has implemented a mechanical ventilation system that includes an exhaust fan that is not controlled by the occupant. This is similar to HUD's manufactured housing code which requires either a mechanical or passive system designed to provide outside air. In the Gulf Coast areas, outside air may bring excessive moisture into the home, particularly in the summer months. The choice of a ventilation system should consider the capacity of the heating, ventilation and air conditioning (HVAC) system to handle the thermal and moisture loads. There is a tension between ventilation and energy costs, as increasing ventilation in a unit will increase the energy demand of the unit.

Twenty-two units were subjected to a blower door test by the building sciences evaluation team to assess how air sealed, or "tight," the home is. During the series of tests on 22 separate units, the blower door results place the units solidly in the "moderate" tightness

category. An extremely tight home would benefit from little energy loss, but could be prone to indoor air quality issues. Given the issues surrounding air quality in post-disaster housing, providing additional ventilation is a reasonable approach.

Indoor air quality (IAQ) testing, including testing for formaldehyde, has not yet been conducted. Testing was scheduled and then delayed. Formaldehyde has received a great deal of attention in the media and within FEMA. Some rudimentary testing of selected MEMA AHPP units was conducted by advocacy groups in Mississippi, and suggested elevated formaldehyde levels in the MAHP units. Although the tests reported by those groups suggested higher than "acceptable" levels of formaldehyde in the MAHP units, press coverage of the formaldehyde tests indicate consumer satisfaction with the units. Compared to a travel trailer, the increased window areas, multiple doors and capacity for natural ventilation of MAHP units provides fresh (outside) air that will result in improved indoor air quality.

## Durability

While assessing the durability performance of MAHP units is premature at this juncture, preliminary evidence suggests that the units will perform well in both regards. Moisture is generally the root cause of durability problems in housing, and most durability assessments focus on that topic. The building sciences evaluation will include the examination of the moisture in walls and external examination of common durability

issues. MEMA's maintenance records will also provide detail regarding the performance of the units. This information will be assessed further along in the evaluation.

While long-term performance information is not yet available, nature did test the MAHP Cottages on September 1, 2008, when Hurricane Gustav made landfall on the Louisiana Coast as a Category 2 storm. The following section reviews the performance of the units from a building sciences standpoint. The upcoming 2009 interim report will further detail MAHP's emergency and organizational response to Gustav.

## Hurricane Gustav

Following Hurricane Gustav, MAHP and its insurer conducted separate assessments of MAHP Cottages damaged by the storm. MAHP's insurer ultimately decided that 249 units were destroyed and uninhabitable. All damage was related to flooding. Flood damage ranged from the wetting of the insulation under the units with no evidence of other damage, to the unit or the installation materials destroyed because wave action pushed the unit off its foundation piers. According to MEMA, the insurance company declared any unit that had wetting of the subfloor to be a total loss. This apparently was a preemptive assessment, based on the potential for mold growth below the carpet and tile.

A HUD building sciences expert visited Mississippi after Gustav to assess the damage. An examination of the units that

were displaced from their foundations revealed significant water damage, but no evidence of structural compromise. In units that experienced several feet of water inside, the ceilings were damaged by floating furniture and debris, but the crown moulding was intact and straight. Some units that experienced wave action lost siding on the windward side. The conclusion was that failure of MAHP units during Hurricane Gustav was due to location decisions and not unit design. In some cases, further elevating the units might have prevented water damage, but it would have masked the real issue, which was the MEMA and FEMA decision to allow a one-for-one replacement of FEMA travel trailers with Cottages in coastal and other areas prone to flooding.

## Preliminary Findings

***Mississippi's decision to embrace factory built construction resulted in higher quality, lower cost units, which could be produced faster than stick-built housing, be re-used and have a reduced impact on the disaster-affected area.***

Generally, factory built homes are considered to be less expensive than site built housing and the finished construction is more consistent. In a factory production process, the availability of tooling, supervision and highly refined production processes can yield a very consistent product. While consistency and high quality are not necessarily linked, when combined with a strategy to produce high-quality units, factory-built housing can result in a first-rate product. The observations of the units produced by MAHP manufacturers suggest they are of high

quality and closely reflect the goals and vision of the designers and MEMA.

Another benefit of factory-built construction is speed and minimal impact on the disaster-affected community. Conventional site built construction frequently requires many months to complete. It is not unusual to see site built construction durations in excess of two months, compared to factory construction durations of about 10 days, followed by a short period of transport and installation. The use of factory-built homes with undercarriages for transport enabled MAHP to install units temporarily and remove, refurbish and redistribute a unit to another household in need or a permanent development. Stick-built homes do not have such flexible re-use possibilities.

***Multiple vendors producing similar units provided both a measure of competition as well as a reduction of risk for the overall program.***

The competition among manufacturers, combined with the incremental procurement process, allowed MEMA to produce a large number of units quickly and to control the pace of production according to need and capacity to install units. As the manufacturers developed greater experience with the production of the homes, they were able to benefit from that experience, which helped offset increases in costs. The contracts were awarded during a period when there was rapid escalation in construction material costs, and efficiencies in the production process contributed to the maintenance of unit quality and cost effectiveness.

***Establishment of a staging area, or transition site, in Gulfport provided an opportunity to increase the consistency of the units produced, reduce costs and control the inventory of units.***

The transition site allowed MEMA to receive, document and inspect the units prior to installation. The site also provided a central location where construction issues with the units could be addressed by the manufacturer. This improved the timeliness of the repairs and also reduced the costs for both MEMA and the unit producer. Using a staging area was a departure from the typical way of producing manufactured housing for the market, in which the manufacturer builds a unit and ships it to a local or regional retailer. While these inspections may have been seen as increasing the cost to the manufacturers, providing a single location where the issues identified could be addressed made the process more efficient.

MEMA implemented a successful strategy for incremental delivery of units to the transition site to avoid excessive inventory build up. By limiting the transition site to about 300 units, with additional completed units held at the manufacturer's facility, MEMA was able to avoid attracting negative attention similar to that displayed following Hurricane Katrina, where media outlets showed FEMA holding areas with thousands of unused travel trailers and mobile homes.

***Temporary installations may have impeded acceptance of MAHP units as viable permanent housing solutions.***

Above-ground utilities, particularly sloping sewer lines, may have contributed to a lack of

awareness about the capabilities of MAHP Cottages to be permanently installed. Any future disaster housing program producing units that can be used temporarily or permanently should develop a robust strategy to address this assumption.

***Observed installations suggested a need to revisit installation plans and procedures.***

Installation of the units seemed to lag behind the production pace because multiple arrangements had to be coordinated prior to installing a unit. While several factories were producing MAHP units, installation required time-consuming processes including screening and selection of the recipients, gaining local approvals and permits for the site, site preparations, and the actual installation of the unit. Given the complexity of the task, production, delivery and installation of the units appears to have been well managed. MAHP's experience suggests disaster-housing programs need to realistically anticipate the pace of installation and coordinate production accordingly.

Building sciences evaluators suggested that some unit installations were imprecise and did not follow installation procedures. However, these installations were not believed to impact the long-term durability of the units. The evaluators also found evidence of poor quality ramps installed for accessible units. This suggests that temporary installation procedures should be reviewed to the same degree as the design and production phases. Furthermore, this suggests an intensive quality control component is required for all phases of a

disaster-housing program, from design to installation.

***Design reviews and initial testing indicate MAHP units balance the need for improved indoor air quality with energy efficiency.***

MAHP units are moderately air tight according to the blower door test. This allows for adequate ventilation and still maintains reasonable energy efficiency. The building sciences evaluators will conduct indoor air quality (IAQ) testing as part of the evaluation and provide results in a future report.

***Preliminary evidence suggests MAHP units will be durable and maintain structural integrity after adverse weather events.***

MAHP Park Models and Cottages are constructed to meet or exceed IRC and HUD code. The units are strong and can resist up to 150 miles per hour wind speeds, have hip roof configurations constructed of metal roofing, and offer cement fiber siding. They maintained structural integrity during Hurricane Gustav with the only damage resulting from flooding. A design review anticipates minimal moisture and durability issues. A full durability assessment will be part of future evaluation reports.

# Chapter Five:

## Observations and Lessons Learned

This case study captures MAHP operations as temporary housing activities are winding down and permanent housing and demobilization activities are beginning. Even at this early stage, it is possible to make preliminary observations and suggest lessons for future implementers of disaster housing programs. This chapter is organized around AHPP's key evaluation research questions:

- ◆ How viable and livable are the MAHP units and how did they affect quality of life for those who lived in them?
- ◆ How did MAHP's approach to the project and organizational capacity affect implementation and participant outcomes?
- ◆ How were units accepted by community stakeholders and to what extent did community response affect program implementation?

### **How viable and livable are the MAHP units and how did they affect quality of life for those who lived in them?**

Both components of the AHPP evaluation are ongoing. The building sciences evaluation is still in progress and requires that at least some units complete the entire use cycle, from design to demobilization, before final conclusions can be reached on physical performance. Additional insights on the effect units have on quality of life for residents will come from the first participant survey, scheduled for fall 2008, and a second follow-up survey in summer 2010. In the interim, it is possible to identify some lessons about the process of designing,

manufacturing and installing units, as well as to report on stakeholder perceptions of quality of life issues.

### **Technical and quality requirements should be established in advance**

Many of the technical adjustments that MAHP had to make in unit design and installation were an inevitable part of new product development. Although the chosen manufacturers had experience with mobile homes or modular housing, each had to establish a new production line, adjust manufacturing tasks and materials and develop new quality management protocols. Installers were also required to respond to installation requirements that were more stringent than those typical of mobile home installations. Finally, MAHP's expectations in terms of workmanship and aesthetics appeared to exceed the norm.

Presumably all of these challenges could be mitigated in the future by having standard designs and specifications, as well as standing agreements with manufacturers prior to a disaster. Although a nationwide standard might be possible for the units, some adjustments in installation specifications would likely be needed to accommodate local topographic and soil conditions.

### **Consider options for meeting special needs**

The MAHP units resulted in important improvements to the quality of life of individuals with mobility impairments. To reduce complexity and at the same time be

responsive to households with special needs, one MAHP staff member suggested that the interiors of all units be made compliant with UFAS, but that ramps be installed only for those occupants that actually need them. This could reduce some of the complications of unit assignment and might prevent some of the special needs requests that MAHP received which were actually attempts to obtain larger units. However, it could also make the units more expensive.

Another staff member suggested that only a small portion of units should be built fully UFAS compliant and that the remainder of Cottages could be made "accessible-lite," by installing bathroom grab bars and making other minor adjustments that would be valued by elderly households and those with minor mobility impairments.

MAHP's experience suggests that similar disaster housing programs must carefully consider the best approach for meeting residents' accessibility needs. Whether it be maximizing universal design concepts, manufacturing adaptable units or developing a percentage of fully accessible units, program implementers will have to balance the needs of residents with the potential cost and schedule implications that result from these approaches and design types.

The confusion and frustration that MAHP encountered related to UFAS could be remedied by establishing clear and consistent UFAS requirements for units that are designed to meet longer-term temporary needs. Implementing organizations must receive very clear, timely guidance from federal and

state officials during the design stage, before construction begins.

### Analyze and address "right-sizing"

Careful thought needs to be given to how unit types and sizes are assigned. MAHP's initial disaster-oriented right-sizing policy is not suitable for a recovery period of one or more years. Immediately after a disaster the need for shelter makes the smaller units that are easier to transport and install more acceptable. For longer-term temporary housing, two- and three-bedroom units are likely to be a better match for families of three people or more, even though these units are more difficult to transport and install.

A policy that ties the type and size of a unit assigned to the length of time a household is expected to occupy the unit makes sense. However, estimating recovery timeframes early on would be challenging and making decisions based upon early data could lead to misunderstandings and claims of favoritism.

It is also important to note that not all small, one-bedroom units are the same. Even though the Park Model was developed as a direct replacement for a travel trailer, the quality of life for residents of trailers and Park Models was quite different. Anecdotal evidence from MAHP staff and participants indicates a significant improvement in quality of life upon the move from a trailer to a Park Model. Participants appreciated the larger unit and full-size kitchen and bathroom, as well as the higher ceilings and additional storage. The participant survey in fall 2008 will ask

questions that compare participant experiences with both units.

### Housing providers should carefully consider how many different types of units are optimal

As part of its program approach, MAHP chose to test a variety of unit designs and sizes and to purchase units from a variety of manufacturers. Although this was a worthy strategy for a pilot, it made implementation more complex. Several MAHP staff suggested that having as little variation in unit type as possible would facilitate program implementation. Finding the right balance between variety and complexity is an important challenge. For example:

- ◆ The fact that MAHP units came in various colors was considered a plus by many stakeholders. The colors helped the units fit in better with the local architecture and helped to avoid an institutional look. But the color variations led inevitably to requests for specific colors.
- ◆ Having three different models (Park, Cottage, Eco-Cottage), three bedroom sizes and UFAS compliant and non-UFAS compliant units made tracking and assigning units more complex than if there were fewer options. However, having these options permitted MAHP to better meet participants' needs and the pilot program's goals.

Certain options or amenities may be valued differently in other locations and at different stages of a disaster response, but the need to strike a balance applies in all cases. It also appears that planning entities should, to the

extent practicable, understand the anticipated needs of the population by using experiences during past disasters and data on the demographic characteristics of households that live in areas at particular risk, such as the Gulf Coast. This preparation could help inform preliminary decisions about bedroom sizes and accessible units.

### **Unit designs should consider both temporary and long-term uses**

Assuming that some long-term temporary units may become permanent, implementers should consider carefully how the unit compares to the standards the community will return to once the emergency period ends. Square footage requirements in local codes became a stumbling block for MAHP in transitioning units from temporary to permanent housing. Manufacturing larger units would undoubtedly create its own issues, including making them less feasible for temporary housing (i.e. transporting the units and installing them on lots with minimal space due to debris). However, designing temporary housing units to which additional rooms can be added easily, as MAHP partners are doing, or units that are easily combined seem to be promising approaches.

It is not clear how quickly an assessment can be made of the length of time temporary housing will be needed and whether some form of modular housing will be needed to support long-term recovery of the housing stock. Both MAHP staff and local officials suggested that travel trailers or Park Model units could be used for an immediate response during which longer-term recovery

needs are assessed. The smaller units could then be replaced with Cottages if it appears temporary occupancy will be for an extended period or if the units are expected to support permanent recovery efforts. Repeating unit installation for a single family is not optimal, but may be preferable to providing enhanced units for short-term needs. In large disasters, it may be possible to make some decisions about unit needs quickly enough to avoid the duplication. For example, when housing and neighborhoods are completely devastated by storm surge similar to Katrina, it is reasonable to assume that recovery will take more time and that larger units may be more appropriate.

### **Residents need training on unit features and amenities**

Both maintenance personnel and housing advisors recommended better education for occupants about the workings of the units and appliances during the move-in process. For example, some applicants had not previously owned microwave ovens and others had never operated a fire extinguisher. MAHP staff and participants reported that confusion about how to correctly operate the air conditioning system was a significant issue. Housing advisors were trained to assist the residents in some areas. However, in retrospect, MAHP's maintenance coordinator believes more training for residents could have reduced the maintenance workload. Additional training might also have eased stress for the residents.



## How did the grantee's approach and capacity affect implementation and outcomes?

### A combination of disaster response and recovery expertise is needed

Mississippi's experience suggests that the type of agency selected to administer a temporary-to-permanent housing effort is an important consideration and that one agency may not be able to cover all the bases. MEMA's thorough understanding of the temporary housing objective and the initial focus on simulating disaster conditions helped drive the organization's performance and enabled MAHP to field over 2,800 units quickly and effectively.

Despite the clear success of the program, MEMA Director Mike Womack acknowledged that "housing" and particularly permanent housing is not MEMA's area of expertise and speculated that a State emergency management agency might not always be the best organization to manage the temporary-to-permanent component of recovery operations.

MEMA has in-depth emergency housing expertise and PBS&J brought project management and engineering skills to the table. As MAHP transitioned into the permanent housing phase, a different set of experience and skills were needed. Planning for permanent placement was peripheral until early 2008. MAHP staff indicated, in hindsight, that intensive planning about permanent housing issues should have begun at program start-up. Because it had less experience in housing and community development, MEMA may not have fully

understood the lead time that the permanent housing process would require.

Similarly, an organization more experienced in housing programs might have been able to streamline some procedures. For example, the separate agreements MAHP used to establish the property owner's right to enter, occupant maintenance responsibilities and pet policies are typically included in residential leases.

Some of the opportunities for permanent use of the Cottages as affordable housing may take longer to accomplish than the MAHP March 2009 schedule will allow. It appears that partnerships between state emergency management agencies and state or local housing and community development organizations could be an effective way of handling the rapid initial deployment of housing units and ensuring the best long-term uses of units. In future programs, the implementation team should consider adding a partner able to administer a longer-term disposition approach.

### The Incident Command System provides an effective framework for organizing complex endeavors

A commitment to the formal Incident Command System structure made roles, lines of authority and the decision-making process clear. The ICS approach enabled the organization to continue functioning well in spite of significant leadership and organizational changes in 2008.

### **Having information systems to support decision-making is important**

A strong management structure, combined with an information management system that provided the data needed to hold staff accountable enabled MAHP leadership to manage daily operations effectively during the temporary housing phase. Detailed daily reports that could be generated by county and by the staff person responsible enabled MAHP to identify the specific status of each case and identify production bottlenecks.

However, MAHP also did not fully understand the types of information that would be needed to develop feasible disposition approaches. Additional data collection was ultimately necessary to understand how disposition could best serve occupants and preserve the units as affordable housing.

### **Using contractor resources effectively aids organizational flexibility**

Through the use of contractors and temporary employees, the MAHP organization remained flexible enough to change along with program needs. For example, during the transition to permanency, PBS&J has been able to move some staff to other projects until the need for operations field staff peaks again during demobilization. Similarly, after most units had been occupied, the housing advisors continued to be the primary link with participants but changed their focus from site approvals to working with families to develop permanent housing plans and linking clients with needed community services.

### **Future programs should incorporate a human services strategy**

Although MAHP focused primarily on the engineering, manufacturing and installation challenges of developing a better disaster housing unit, attention was also given to providing services for program applicants. At the program start, management recognized the need for a staff person to help the applicant through the cumbersome process of receiving a unit. As the program progressed, this role shifted from providing logistical help to connecting families with long-term supportive services.

MAHP management and staff reported that they were somewhat unprepared to provide services to households with multiple problems or intensive needs. Although some housing advisors had social work backgrounds, not everyone was trained to provide case management or handle the mental health issues that were more severe after Katrina. In addition, one MAHP manager does not think the program provided support to participants in a way that fostered self-sufficiency. Part of the housing advisor's role was to complete tasks on behalf of the participant (e.g. securing permits, filling out Housing Choice Voucher applications and delivering them to the housing authority), and this may not help participants develop their own coping skills.

In retrospect, several MAHP staff said housing advisors should have received more training to standardize how the role was operationalized in each county, but also in how they approached working relationships with participants. In addition, a community

liaison familiar with the region's social services systems would have been useful to build relationships with partners and inform housing advisors of referral resources in a uniform manner. In spite of being thrust unexpectedly into the role of a social worker, many housing advisors appear to have thrived in their work with participants.

MAHP's experience suggests future implementing agencies should be prepared to serve clients with multiple problems and a human services strategy should be part of a similar temporary-to-permanent housing programs. The strategy should outline how the organization will access experienced staff and the approach to assessing participants' needs and providing ongoing support. Not all program participants will require services, but it is likely that many households will require extra support and guidance in getting back on their feet.

### **State support played an important role in implementation effectiveness**

The involvement of the Governor and support from other State agencies contributed to the program's success. Because MAHP had the attention and support of the State at the highest levels, required organizational resources were available at critical moments. For example, when MAHP's call center was overwhelmed, MEMA staff were assigned to assist. The attention of MEMA's Director and the Governor's staff were also instrumental in working with the local jurisdictions and public education efforts.

## **How did community stakeholders react to MAHP and to what extent did community response affect program implementation?**

### **Barriers to using modular housing are psychological as well as technical**

Even though MAHP emphasized that the Cottages met IRC requirements and qualified as modular housing, leaders in some of the local jurisdictions could not get past "the wheels"—that is the undercarriage used to transport the units. One county supervisor admitted that if the same units had come into the community in two pieces on a flatbed truck, they would have been accepted as modular (permanent) units without question. This does not necessarily mean that temporary-to-permanent units cannot be transported using an undercarriage, but it does suggest a psychological barrier that may have to be overcome in many communities as part of pre-disaster planning or through an aggressive educational process at the time of the disaster. More light may be shed on this topic as other AHPP sites that proposed more traditional modular units bring those units on line. One key step is repeatedly exposing the community to the unit and inviting officials and the public to tour the units. Ideally, a unit should regularly be made available for public view, especially at every emergency preparedness public event.

## **A more comprehensive communications strategy could have been helpful**

Several MAHP leaders stated that despite the significant outreach and the extended MOU negotiations that were conducted, more communication with the community (individual residents and local officials) would have been helpful. Starting permanent housing discussions much sooner would have benefited the permanent housing phase of the program. However, MAHP was faced with a dilemma: to communicate and educate more broadly about permanent housing opportunities might have jeopardized the temporary housing mission and even prevented the program from installing some of the units at all. This suggests that in future disasters a more formal and comprehensive communications strategy would be helpful in addition to as much pre-disaster planning with local jurisdictions as is possible. In addition, a MAHP staff person and local government representative both suggested that the implementing agency bring a jurisdiction's local elected officials and program offices together in one meeting to explain the program, answer questions, plan for possible temporary or permanent developments and offer suggestions for leveraging other resources.

As more nonprofit and for-profit entities began to focus on using the Cottages for permanent housing, some complaints were heard about organizations that seemed to have a "head start" in terms of either allocation of units or receiving funding for installation and infrastructure. In truth, it

appears that these organizations—Habitat, MRHA and Renaissance Corporation—took the initiative to seek out MAHP resources early on and to develop partnerships with the program or the Governor's Office at a time when little interest was being expressed by others. It is not clear that this issue will affect MAHP's performance or outcomes, and MAHP ultimately established a more transparent Letter of Interest process for potential partners. Future implementers should establish an open and formalized partnering process early in the program.

## **Pre-disaster planning for long-term temporary housing is needed**

MAHP and community leaders suggested that pre-disaster planning activities should include a consideration of strategies for addressing both short-term and long-term temporary housing needs and the use of modular units that could transition to permanent housing. Advance discussions and pre-disaster agreements between State and local entities could alleviate local governments' concerns about losing control of the recovery process and expedite appropriate assistance to households in need. Such discussions would also allow communities to review and agree on the design and type of unit used.

Mississippi's experience confirms that providing long-term temporary housing for renters in a major disaster is a special challenge. While homeowners can make their home sites available for placement of the temporary housing, renters do not have this ability. The requirement to pay rent for the

trailer lot may also have been a deterrent to program participation for some renters. Resolving concerns about the design and use of group sites during the pre-disaster planning process could help to address this need.

**Cottages could represent a valuable housing resource and outcomes of future uses should be monitored**

MAHP has produced high-quality units that exceed both the standards set by HUD for manufactured housing and the requirements of the International Residential Code. Local building officials acknowledged the quality of the units and speculated that the two- and three-bedroom models could have a useful life of as long as 30 years.

It is too early to know how many of the Cottages will be sold to individuals or donated to organizations to develop multi-unit housing opportunities. MEMA's current intention is to use normal excess property procedures to dispose of any units that are not purchased or donated. This approach is consistent with MEMA's plan to close-down the program in a timely manner and also reflects the agency's lack of interest in managing a housing program which diverges from their core mission.

It will be important to follow this issue as MAHP winds down its pilot program. If estimates of the life cycle for the Cottages are correct (15 years for the Park Model; 30 years for the Cottages), they are a valuable housing resource. Because the MAHP units are transportable, the opportunity for using them for a future disaster relief effort or for affordable housing outside the immediate disaster area also could be considered.

Even though a formal participant survey has not been completed, it seems apparent that the MAHP units provide residents with important features that positively affect quality of life and that the units could serve as an important bridge from temporary to permanent housing. Pre-disaster planning and coordination among State and local jurisdictions could address major implementation challenges. Furthermore, partnering emergency response agencies with existing planning and housing organizations could ensure the most effective long-term uses of these valuable housing resources.



# Endnotes

- <sup>1</sup> Governor's Office of Recovery and Renewal. Two Years After Katrina: Progress Report on Recovery, Rebuilding, and Renewal. August 2007.  
<http://www.governorbarbour.com/recovery/documents/TwoYearreport.pdf>.
- <sup>2</sup> Mississippi Governor's Office of Recovery and Renewal. Mississippi Recovery Fact Sheet. June 2008.  
<http://www.governorbarbour.com/recovery/documents/RFSJune08.pdf>.
- <sup>3</sup> The John C. Stennis Institute for Government. Katrina's Impact on Sales Tax Diversions – Mississippi Gulf Coast Municipalities. July 2006. <http://www.sig.msstate.edu/files/Katrinataxes.pdf>
- <sup>4</sup> McCarthy, Kevin F. and Hanson, Mark. Post Katrina Recovery of the Housing Market Along the Mississippi Gulf Coast. RAND Gulf State Policy Institute: 2008.  
[http://www.rand.org/pubs/technical\\_reports/2007/RAND\\_TR511.pdf](http://www.rand.org/pubs/technical_reports/2007/RAND_TR511.pdf).
- <sup>5</sup> Ibid.
- <sup>6</sup> Ibid.
- <sup>7</sup> Ibid.
- <sup>8</sup> See the FEMA Incident Command Resource Center for more information:  
<http://www.training.fema.gov/EMIWeb/IS/ICSResource/index.htm>.
- <sup>9</sup> Mississippi Emergency Management Agency and PBS&J. Mississippi Alternative Housing Program Performance Management Plan. October 15, 2007.
- <sup>10</sup> Sun Herald.com. *It Takes a Lot of Houses to be the Home of the State's Largest Employer*. Accessed on July 15, 2008 at <http://www.sunherald.com/editorials/v-print/story/684230.html>.
- <sup>11</sup> Durability by Design: A Guide for Residential Builders and Designers.  
[http://www.huduser.org/Publications/PDF/durability\\_by\\_design\\_part1.pdf](http://www.huduser.org/Publications/PDF/durability_by_design_part1.pdf)  
[http://www.huduser.org/Publications/PDF/durability\\_by\\_design\\_part2.pdf](http://www.huduser.org/Publications/PDF/durability_by_design_part2.pdf)

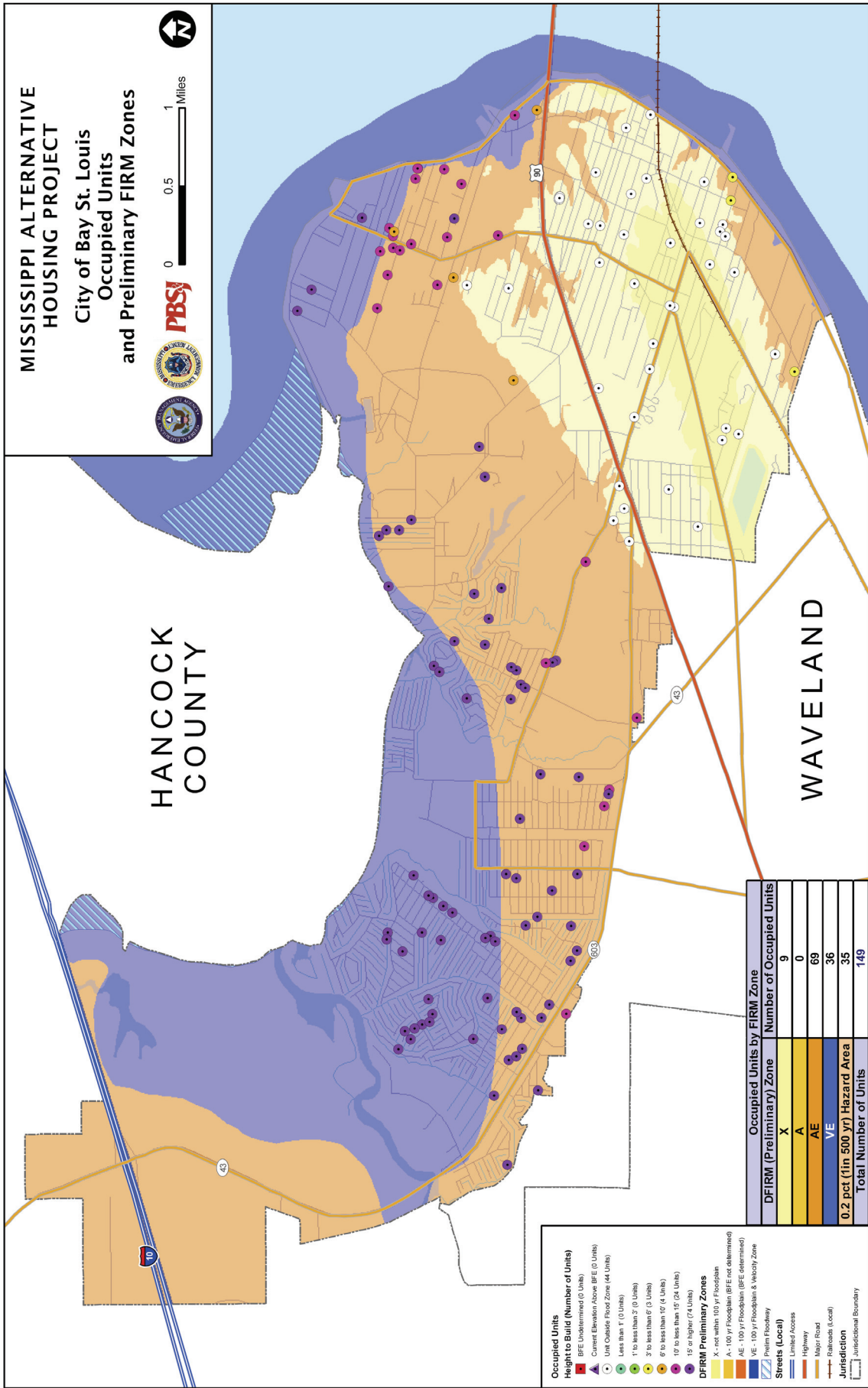
HUD

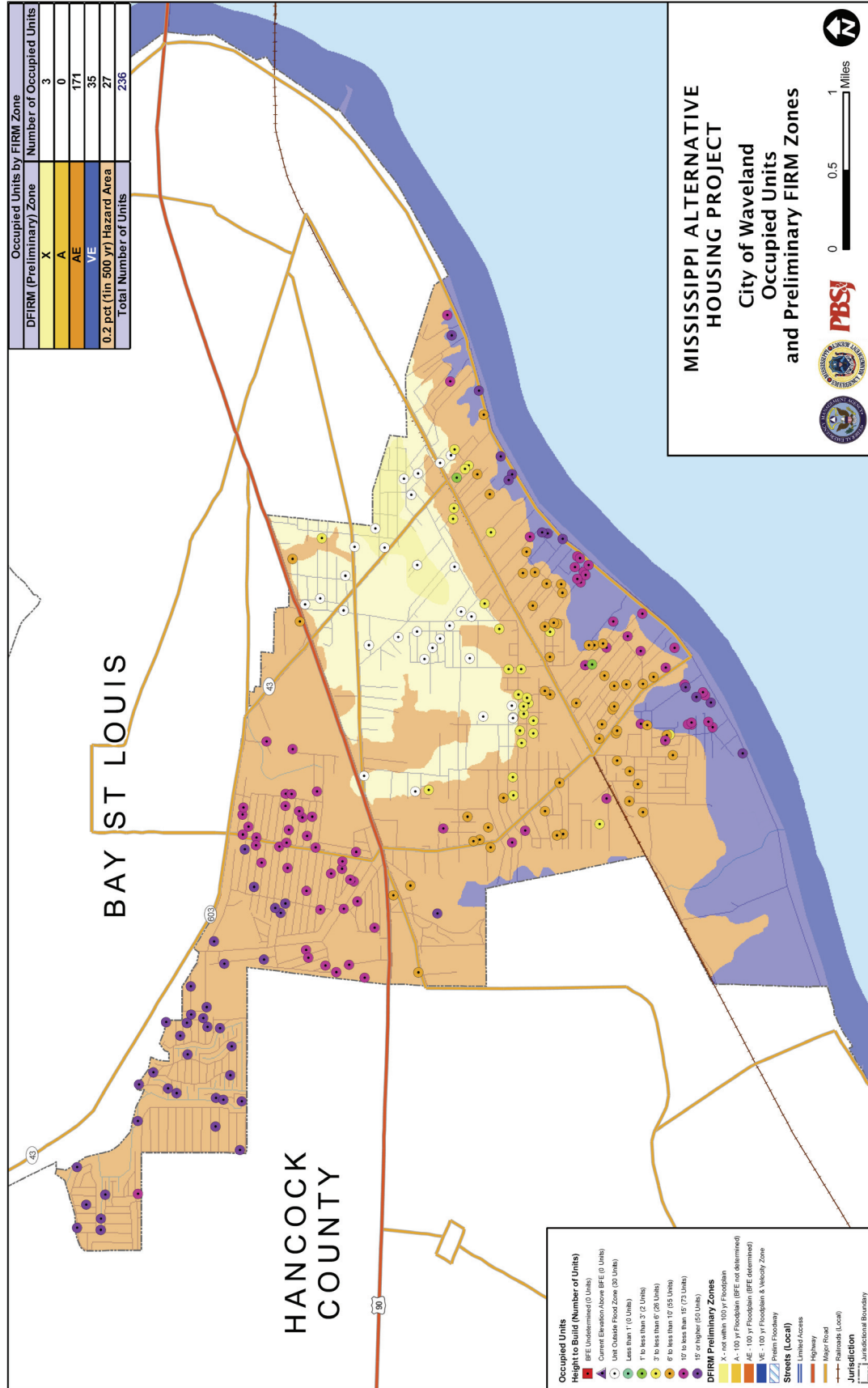


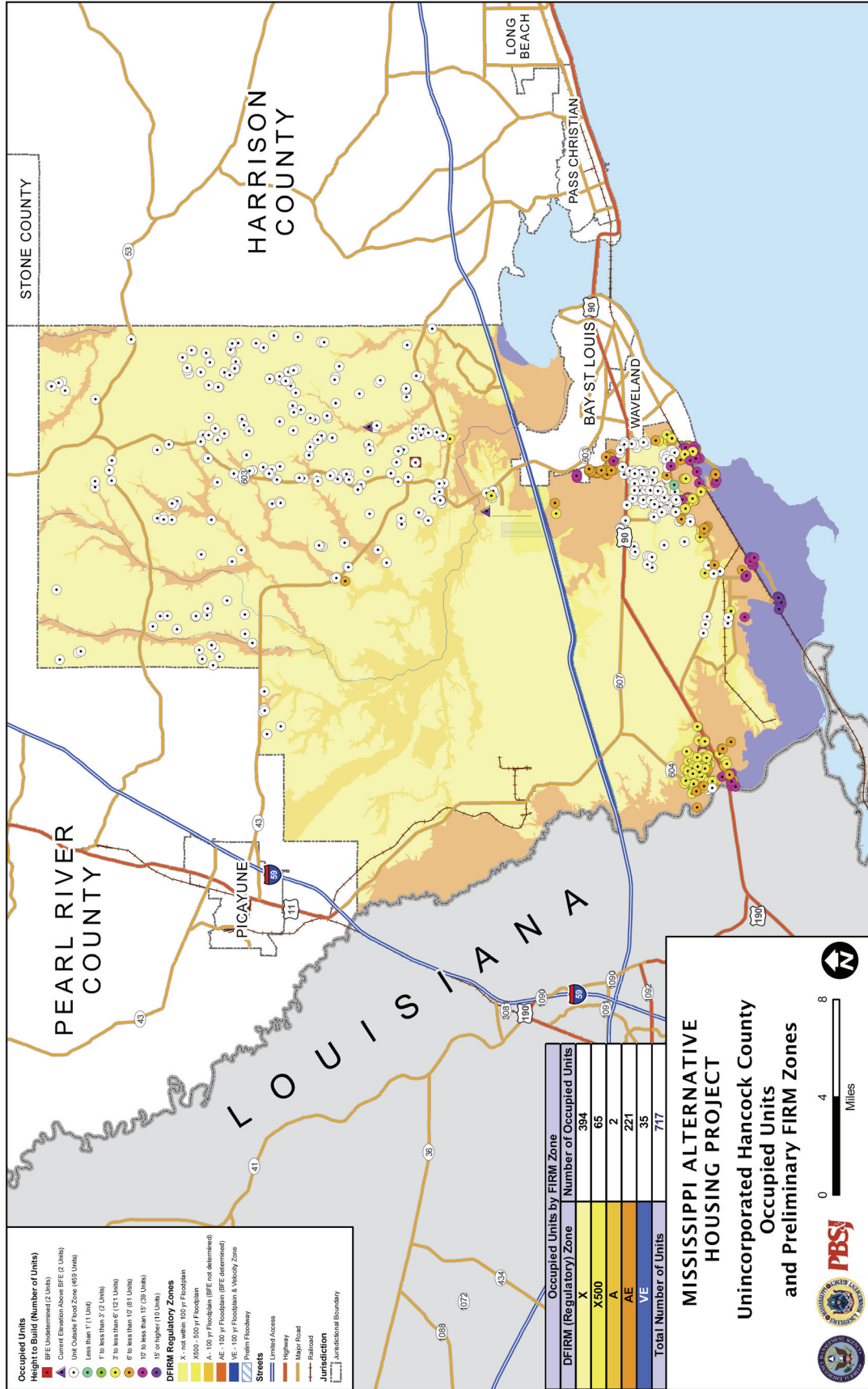


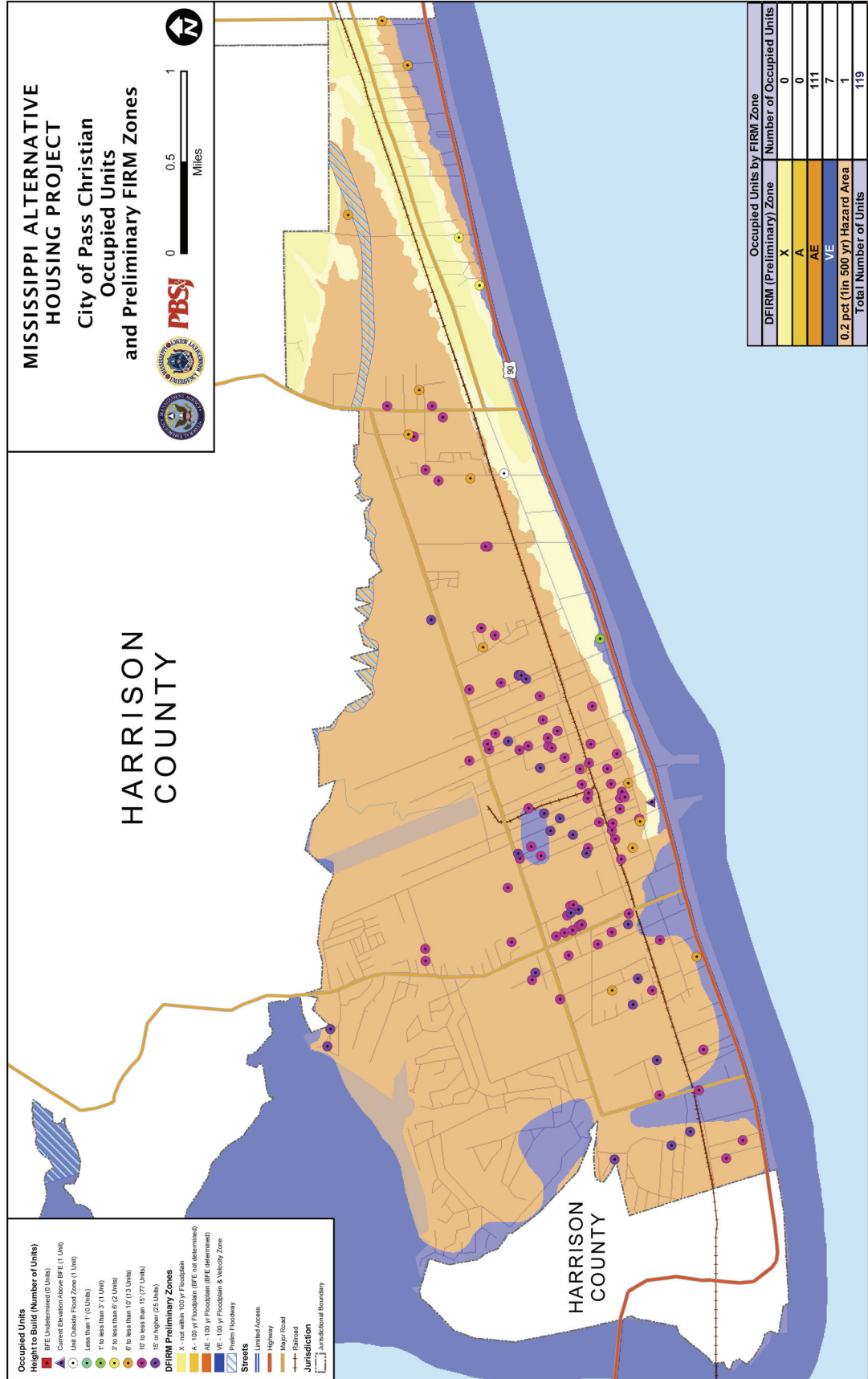
# Attachment 1

## Jurisdiction Maps Showing Distribution of MAHP Units

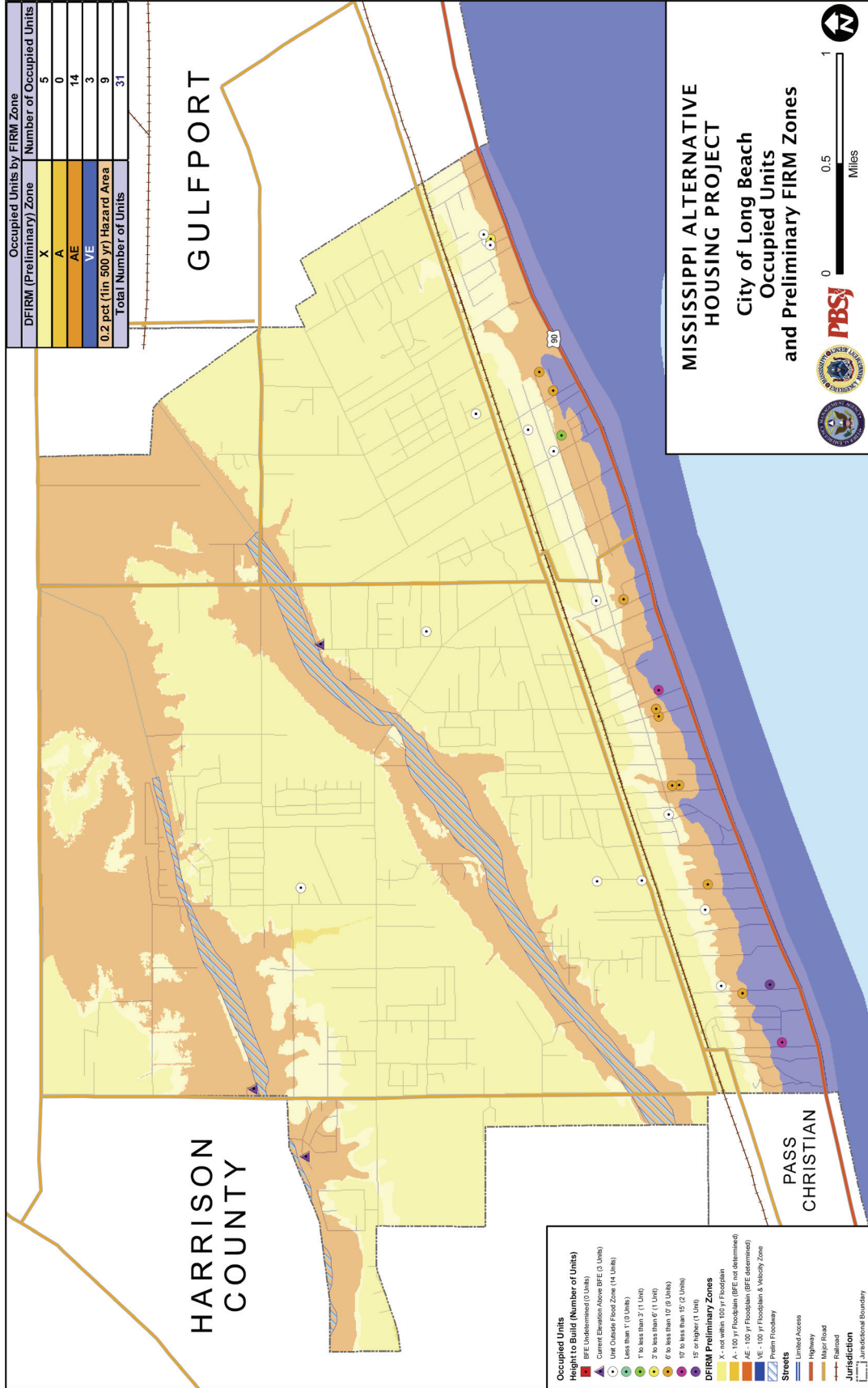


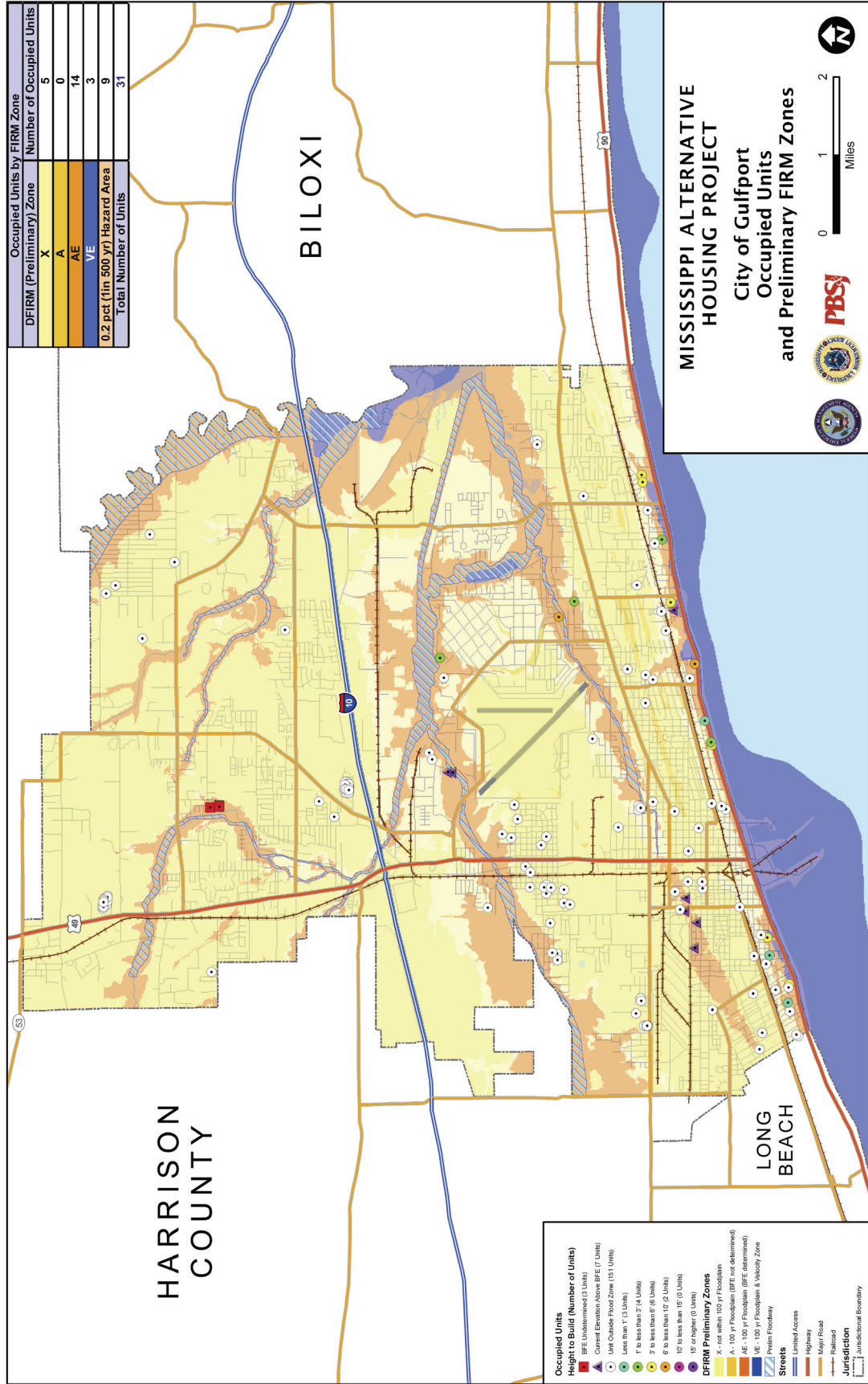


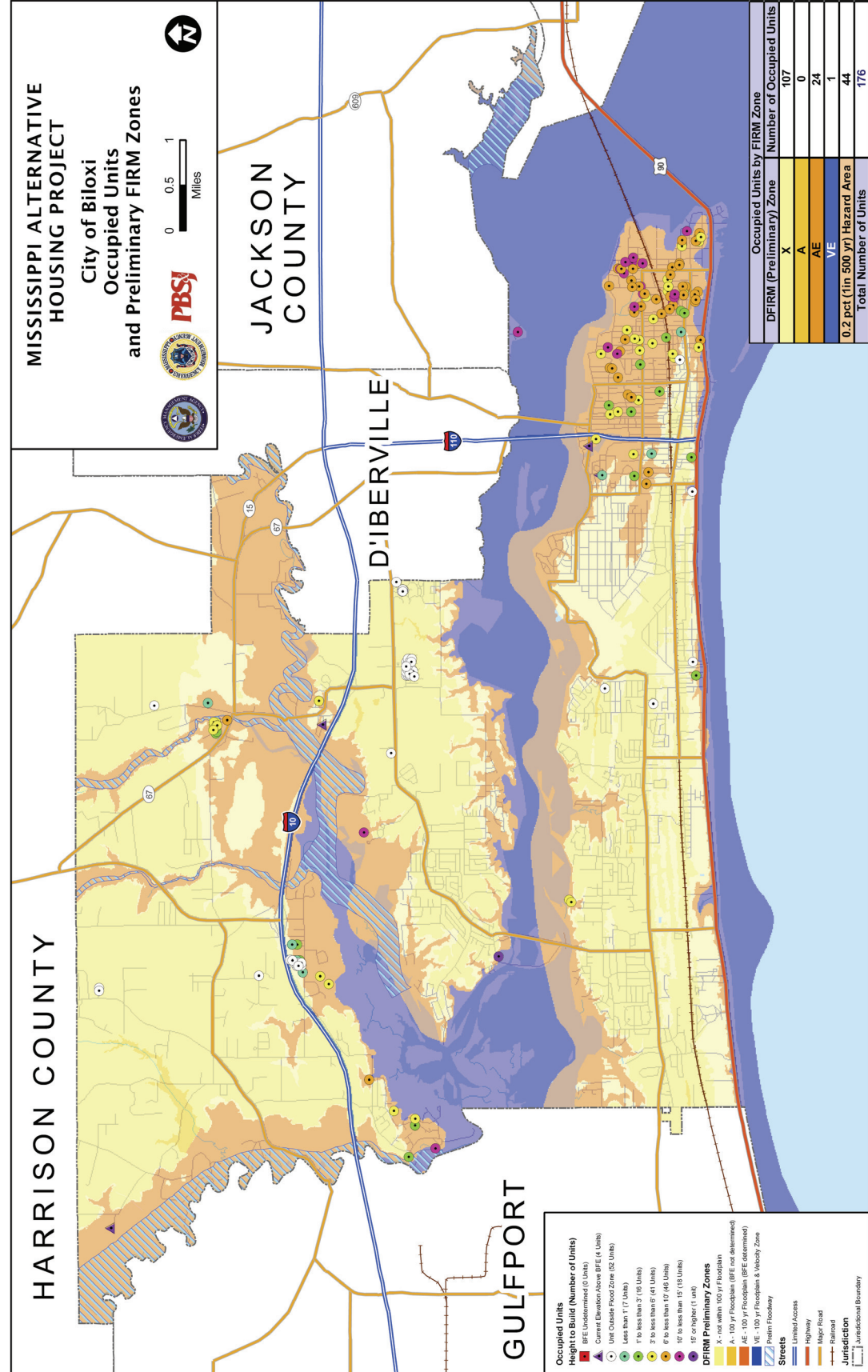




A Case Study of the Mississippi Alternative Housing Pilot Program 67

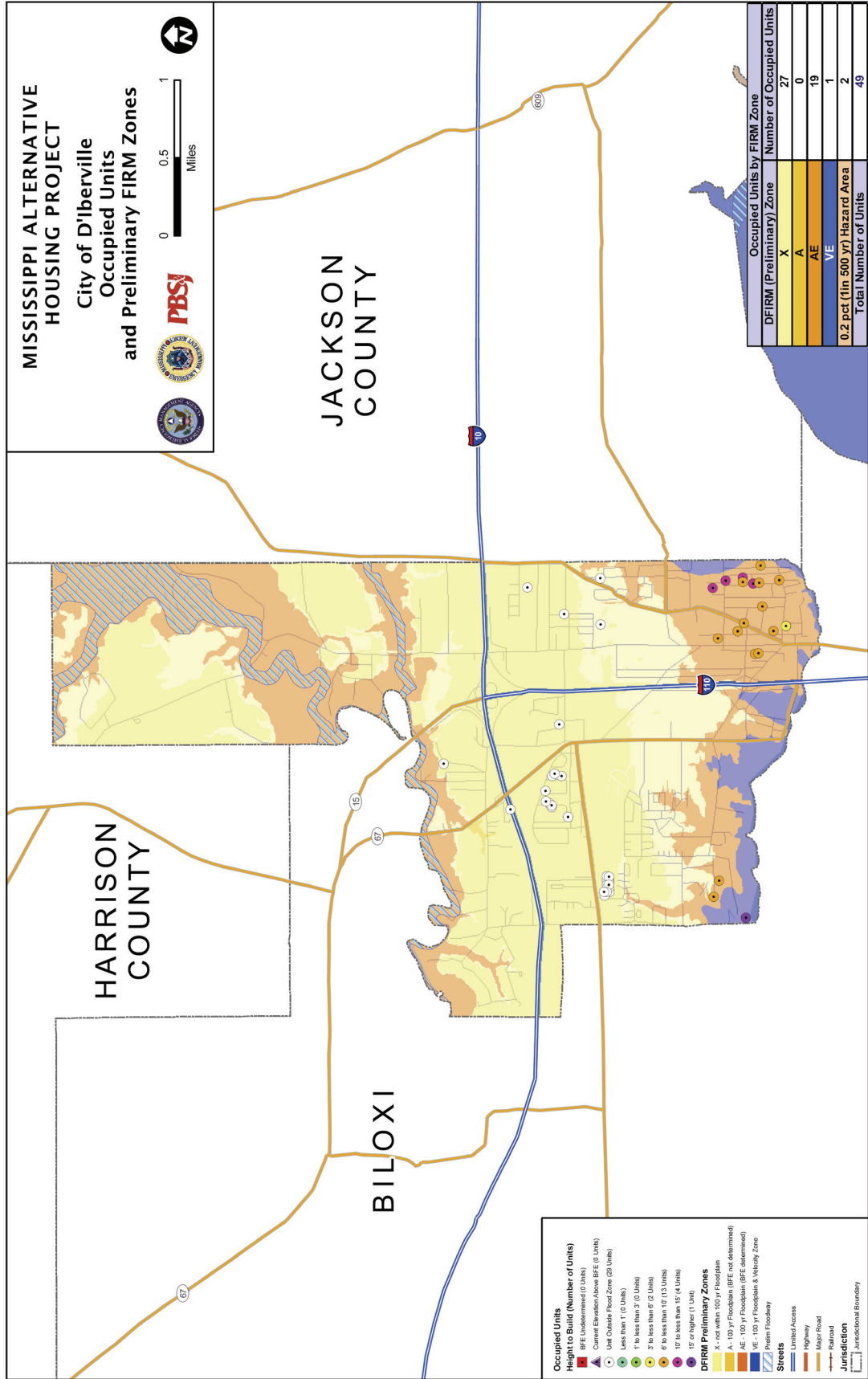




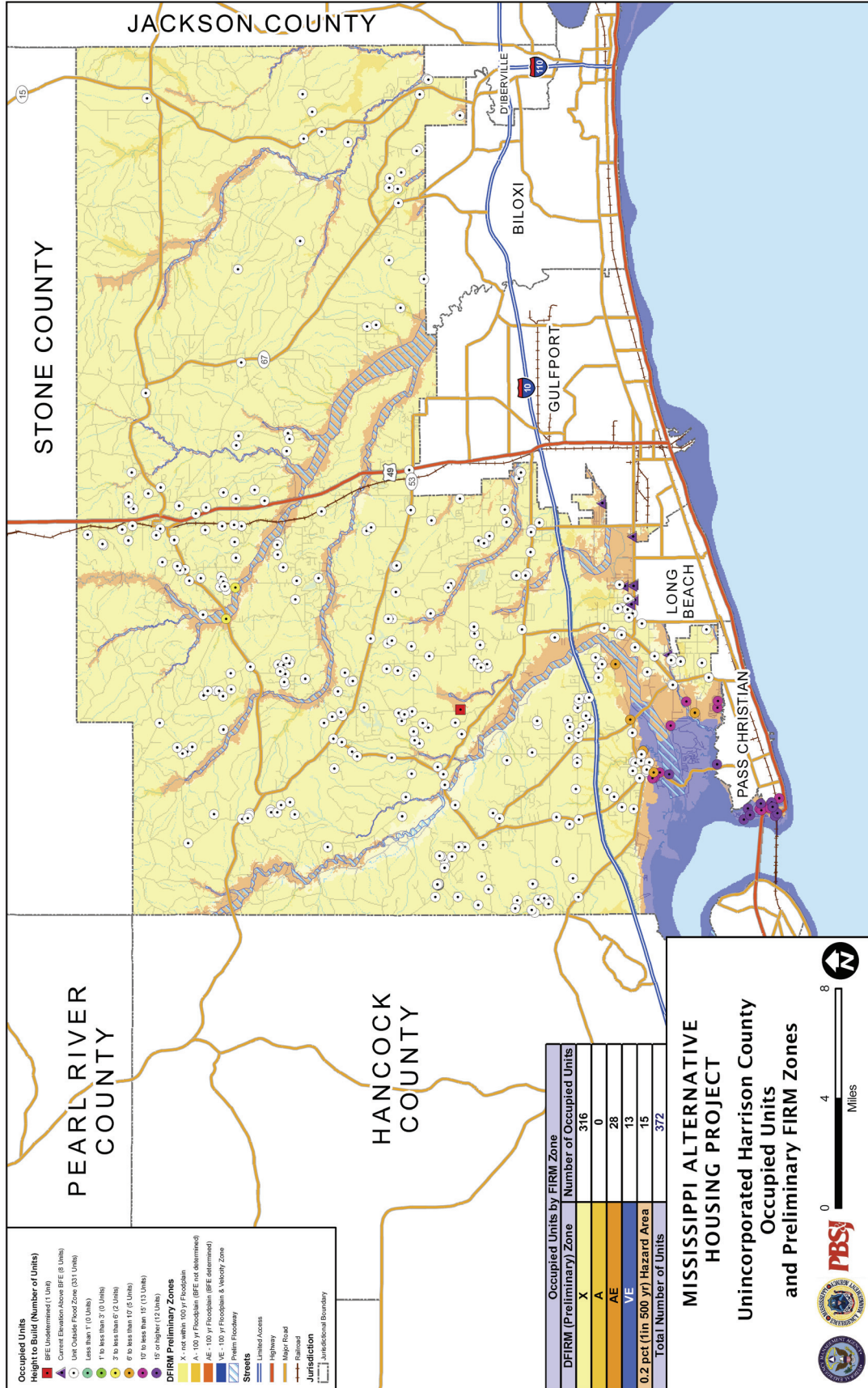


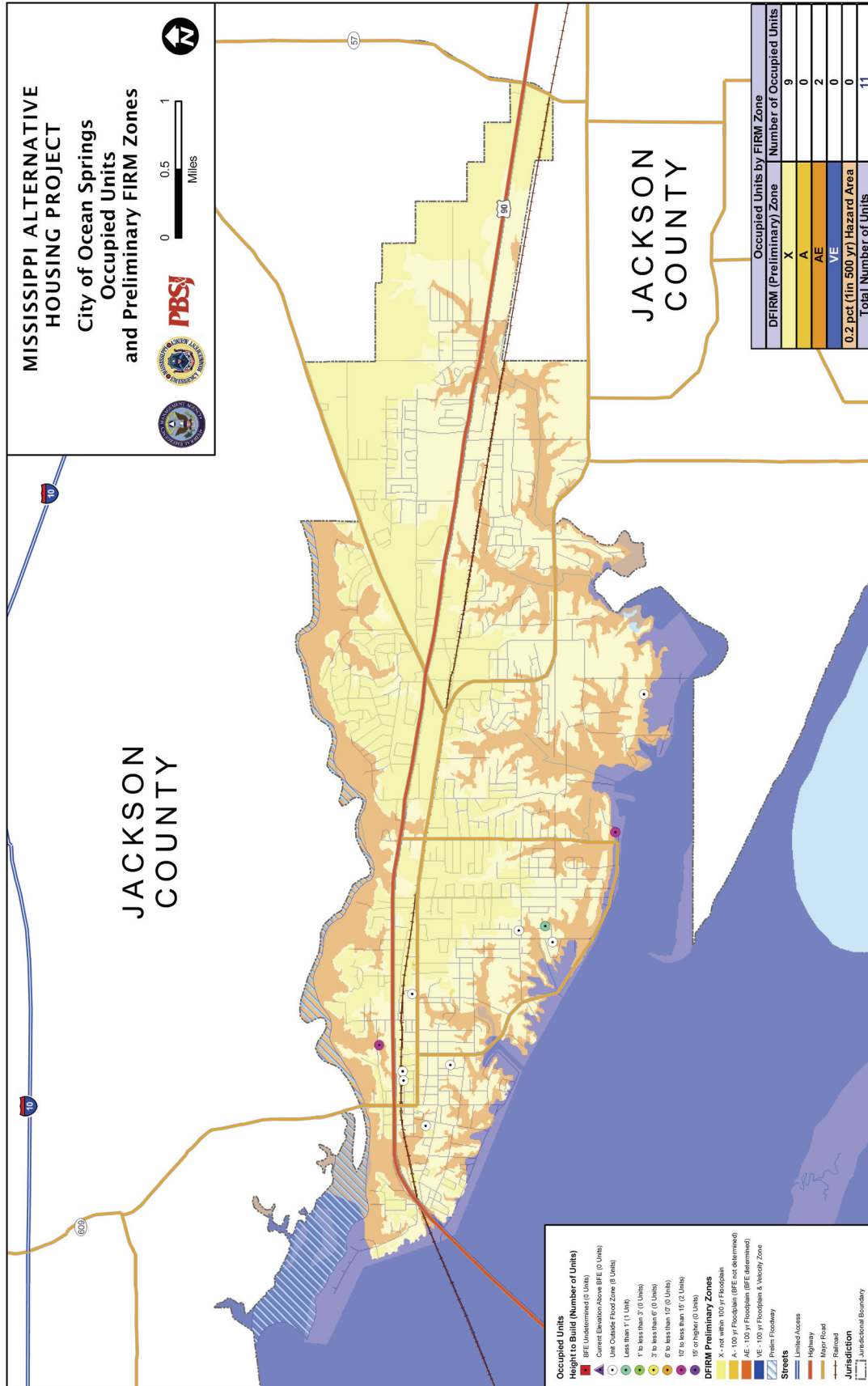
A Case Study of the Mississippi Alternative Housing Pilot Program 70



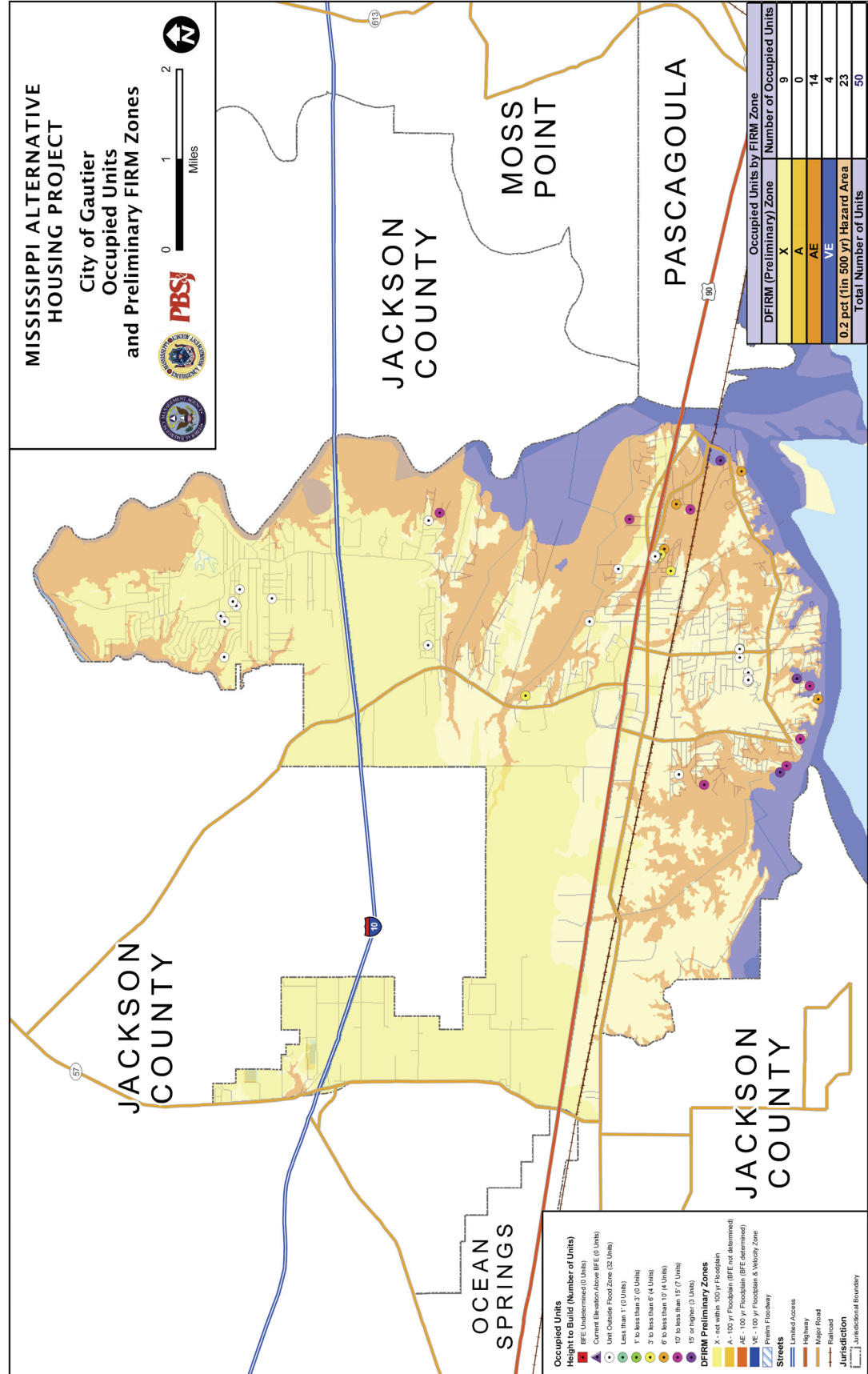


A Case Study of the Mississippi Alternative Housing Pilot Program 71

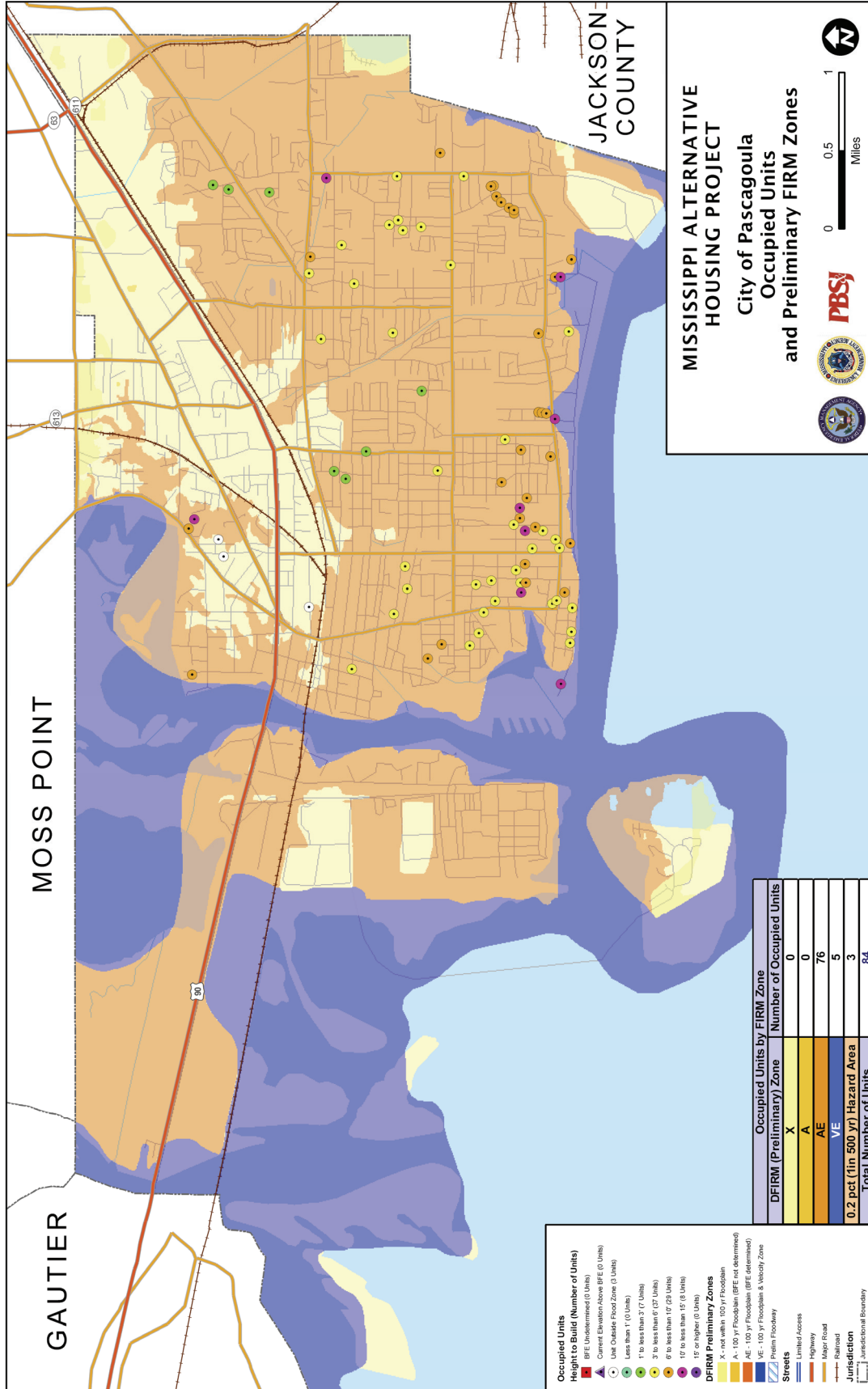


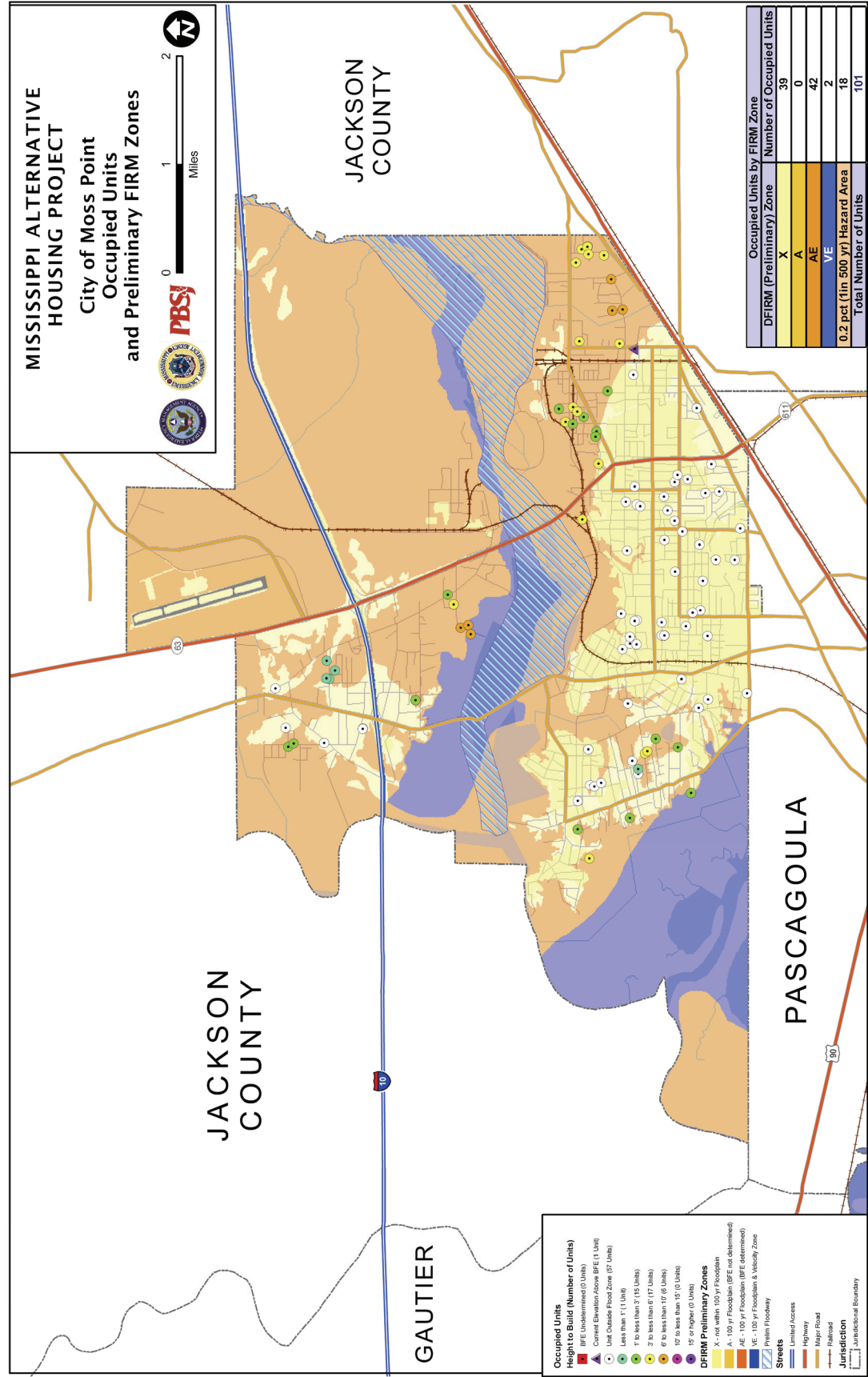


A Case Study of the Mississippi Alternative Housing Pilot Program 73

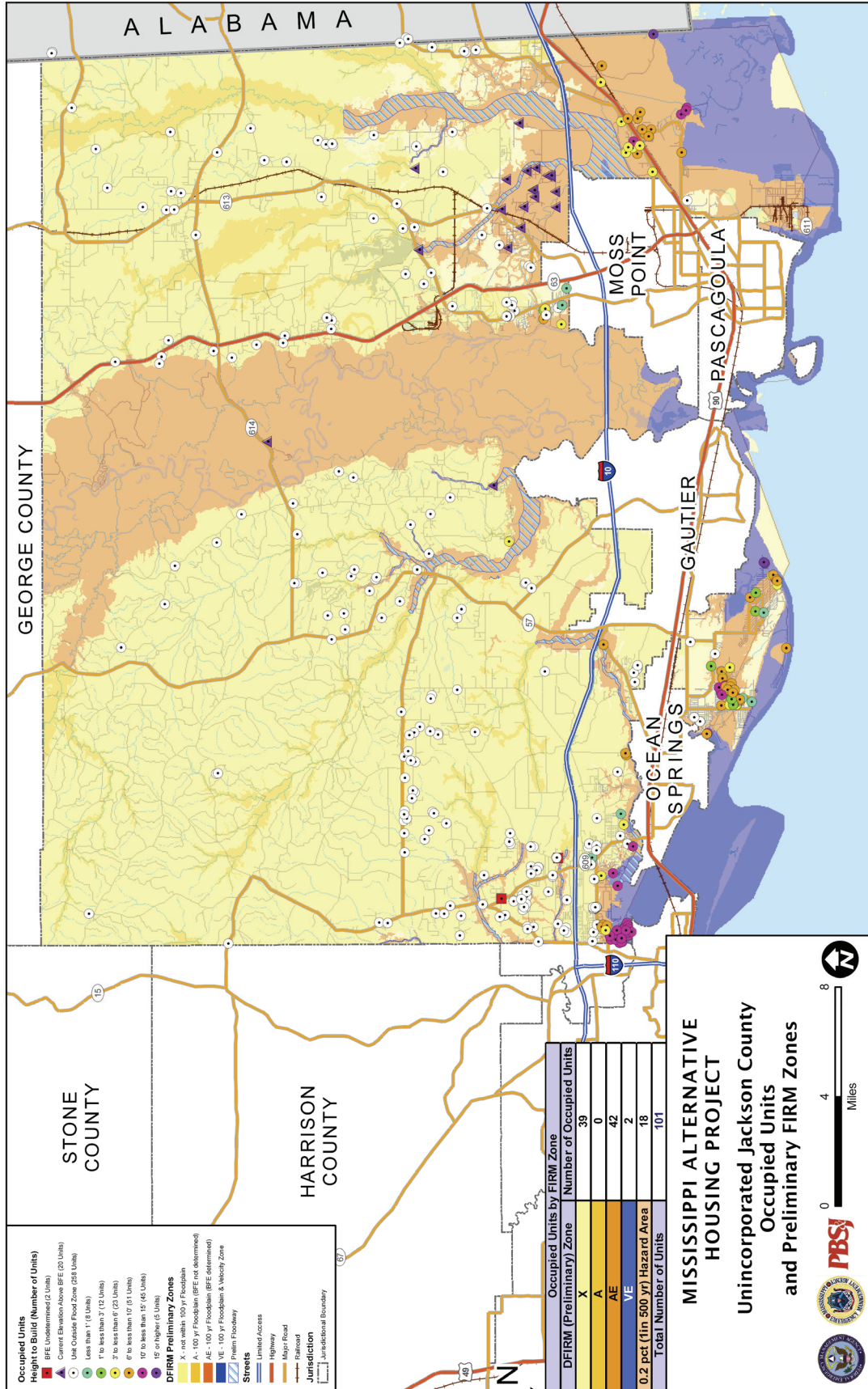


A Case Study of the Mississippi Alternative Housing Pilot Program 74





A Case Study of the Mississippi Alternative Housing Pilot Program 76







# Attachment 2

## Program Goals from the MAHP Performance Management Plan

1. Develop an Incident Command System (ICS)-based management team and identify key staff;
2. Fill field staff positions and provide necessary training;
3. Design and construct MAHP units that will meet 150-mph wind standard and IRC;
4. Develop a streamlined procedure for unit delivery and installation;
5. Develop customer-oriented tenant assistance management system;
6. Develop an Internet-based multi-user Applicant Verification Model;
7. Deploy real-time Site Verification Module;
8. Deploy Maintenance/Demobilization Module;
9. Deploy Reports Module;
10. Commercial Site Module Implementation
11. Design selection criteria and methodology that meet FEMA and the US Department of Housing and Urban Development (HUD) selection requirements;
12. Address larger unit needs and other special resident needs, as they relate to the Americans with Disabilities Act (ADA);
13. Develop manageable multi-family sites through partnerships with commercial park owners, public housing authorities, non-profit organizations, and local long-term recovery organizations;
14. Provide technical assistance for community-driven special projects;
15. Increase public and local government participation through implementing three phased outreach activities;
16. Develop guidelines for information collecting, archiving, and filing;
17. Recruit housing advisors, develop a comprehensive housing assistance list and assist applicants as they pursue permanent housing solutions;
18. Develop a financial management system to use for tracking individual and itemized expenditures; and
19. Establish and maintain acceptable budget with FEMA and meet grant requirements.
20. Establish policies and procedures for demobilization that will meet State, FEMA, and HUD requirements.



# Attachment 3

## Example Memorandum of Understanding

---

### MEMORANDUM OF UNDERSTANDING MISSISSIPPI ALTERNATIVE HOUSING PILOT PROGRAM

---

State of Mississippi

1. **Parties.** The parties to this Agreement are the MISSISSIPPI EMERGENCY MANAGEMENT AGENCY, hereinafter referred to as "MEMA", and The City of Pascagoula, hereinafter referred to as the "Jurisdiction."
2. **Purpose.** The Jurisdiction desires to assist and cooperate with MEMA in the implementation of the Mississippi Alternative Housing Pilot Program ("MAHPP") and to support the Jurisdiction's residents who resided in Jackson, Harrison and Hancock Counties, Mississippi on August 28, 2005, and were displaced from their residence as a result of Hurricane Katrina and who are currently living in travel trailers and/or mobile homes within aforementioned Jurisdiction provided by the Federal Emergency Management Agency ("FEMA").

The MAHPP is a pilot program implemented by FEMA and administered by MEMA. The purpose of this portion of the MAHPP is to develop and produce a safer and more comfortable temporary housing unit for use in future disasters.

3. **Scope of Agreement.** Jurisdiction agrees to allow the Park Model, Mississippi Cottage, and/or Green Mobile (collectively "MAHPP units"), to be placed on occupant-selected sites, which are acceptable and approved by MEMA and the Jurisdiction. The sites may include private lots, lots provided by the Jurisdiction, existing or new commercial sites, and private non-profit sites. In accordance with FEMA Recovery Disaster-Specific Guidance, the Jurisdiction acknowledges a portion of the temporary units may be placed below the Jurisdiction's Advisory Base Flood Elevations. Occupants who are selected may present MEMA and the Jurisdiction alternative sites to be considered. Jurisdiction agrees to allow the occupants to maintain the unit on the approved site for a minimum of six (6) months from the date the unit is placed on said site and up to twenty-four (24) months from the date FEMA awards MEMA the grant funds. Jurisdiction agrees to allow MAHPP units on a temporary basis only, so long as the occupants are not allowed to purchase the MAHPP units for permanent use in said Jurisdiction, without further written authorization from the jurisdiction.
4. **Conditions of Agreement.** The following conditions shall apply:
  - A. Within the Jurisdiction, Park models may be installed at any site where a travel trailer is currently allowed. Units larger than the Park model may be considered for temporary installation, on an individual basis. Criteria will be (at a minimum) that the recipient currently lives in temporary housing at the site, permanent housing is under construction and progress is made monthly, the unit can be placed within the lot without causing sight distance (traffic) or ingress/egress issues, and that the State will be responsible for removal of the unit no later than March 2009. Temporary installation of units larger than the Park model will not be allowed without specific consideration and approval by the Jurisdiction. Temporary installation of the Green Mobile unit will be considered under the same circumstances, and only for ADA compliance.
  - B. All units placed under this Memorandum of Understanding will be placed on a temporary basis only.
  - C. MEMA shall be solely responsible for the installation of the alternate housing unit and; coordination with FEMA to effect removal of the existing temporary housing unit. Infrastructure adjustments as necessary to facilitate the installation shall be the obligation of MEMA and/or the Occupant as per the grant plan.

81848v034

- D. MEMA maintains ownership of the temporary unit for the duration of the temporary installation. The occupant is responsible for the maintenance of the unit, as per the terms of the Maintenance Agreement. The Jurisdiction will refer all inquiries accordingly.
  - E. No unit will be placed on a site where sight distance (traffic safety) is compromised by the installation. [Can the subcontractor co-ordinate with the City??]
  - F. MEMA shall notify E-911 of any special needs at a site at the time of installation.
  - G. Temporary installations in Special Flood Hazard Areas, based on the published FIRM maps, shall be completed in accordance with the published Base Flood Elevations (BFEs) and agreements with FEMA on such placements.
  - H. MEMA shall be fully responsible for removal of all temporary units at the end of the specified term, including but not limited to all legal expenses, coordination of the resident, physical removal and disposal of the unit, and reasonable site restoration to prevent erosion following the removal.
  - I. No agreements regarding purchase of a temporary unit to be placed within the boundaries of the Jurisdiction shall be made between MEMA and the occupant without written approval from the Jurisdiction.
5. Consideration. As consideration for the performance of the actions referred to "Scope of Agreement", MEMA agrees to include the Jurisdiction and its residents in the selection process approved by FEMA for MAHPP.
6. Period of Agreement. This Agreement will become effective on the date this Agreement is executed and remain in effect until March 30, 2009 or until such other time as both parties agree to same in writing.

In witness whereof, the parties hereto have executed the Agreement on the date indicated below, after first being authorized so to do.

6-20-07  
DATE

6/20/08  
DATE

MISSISSIPPI EMERGENCY MANAGEMENT AGENCY

By: [Signature]  
THOMAS M. "MIKE" WOMACK, Executive Director

CITY OF PASCAGOULA

By: [Signature]  
Title: MAYOR