Resilience Planning:

What Communities Can Do to Keep Hazards from Turning into Disasters

U.S. Department of Housing and Urban Development | Office of Policy Development and Research

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Resilience Planning: What Communities Can Do to Keep Hazards from Turning into Disasters

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Foreword

The U.S. Department of Housing and Urban Development (HUD) has been a leader in supporting community resilience efforts through a variety of grant programs designed to reduce the impacts of natural disasters. As communities across the United States face increasing threats from hazards like hurricanes, floods, wildfires, and tornadoes, HUD has sought to provide both financial resources and practical tools to help localities build resilience into their long-range planning. These efforts include HUD's Community Development Block Grant (CDBG), CDBG Disaster Recovery (CDBG–DR), and CDBG Mitigation (CDBG–MIT) programs, all of which play a critical role in enabling communities to prepare for and respond to disasters better and, as this report's title suggests, to keep hazards from turning into disasters.

Several recent guidebooks seek to assist communities in enhancing their resilience, but the focus has been less on the practical challenges communities face when implementing such guidance. To address this gap, HUD undertook the Community Resilience Planning for Disaster Recovery project to demonstrate how communities can effectively integrate resilience objectives into their existing long-range planning efforts. This project is particularly important because it directly engages communities, providing insights into real-world challenges and solutions for resilience planning.

In partnership with the National Institute of Standards and Technology (NIST), Applied Research Associates, Inc. worked with three diverse communities—the Mississippi Band of Choctaw Indians; Burlington County, New Jersey; and rural Southampton Township in Burlington County. These communities applied the NIST Community Resilience Planning Guide and its Playbook to develop resilience plans tailored to their unique local hazards and needs. This collaboration highlighted the importance of incorporating resilience into comprehensive plans, hazard mitigation plans, and consolidated plans and illuminated the distinct approaches required for different community types.

This report offers practical guidance on how resilience planning can be customized to local contexts, and it can be used by communities of all sizes and facing different types and levels of hazard risk.

As HUD continues to support communities in resilience efforts, the lessons learned from this project will be instrumental in shaping future guidance and training by making resilience planning more accessible. HUD seeks to ensure that all communities, regardless of size or resources, are equipped to withstand the growing threats climate change and other hazards pose.

Solomon Greene
Principal Deputy Assistant Secretary for Policy Development and Research
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Table of Contents

List of Exhibits

Executive Summary

The U.S. Department of Housing and Urban Development (HUD) sponsors several grants intended to help communities become more resilient to future hurricanes, floods, tornadoes, earthquakes, and other hazards. These grants include the Community Development Block Grant (CDBG), CDBG Disaster Recovery (CDBG–DR), and CDBG Mitigation (CDBG–MIT). To better support communities receiving these grants in the future, HUD wants to gain a better understanding of how communities can use existing guidance and tools to incorporate resilience concepts into their long-range plans (e.g., comprehensive plans, hazard mitigation plans, or consolidated plans).

The National Institute of Standards and Technology (NIST) Community Resilience Planning Guide for Buildings and Infrastructure Systems (Guide) is one of four tools identified in HUD Rule 24 CFR Part 91, Modernizing HUD's Consolidated Planning Process to Narrow the Digital Divide and Increase Resilience to Natural Hazards. The NIST Guide provides a six-step planning process for communities to become more resilient to natural and man-made hazards. HUD partnered with the NIST Community Resilience Group and Applied Research Associates, Inc. (ARA) to demonstrate implementation of the NIST Guide and its associated tools in three communities. The communities used the NIST Playbook, a more concise, action-oriented version of the Guide along with several templates to assist the communities in working through the planning process.

The NIST Playbook templates used by the communities were effective aids for documenting work done and guiding conversations among planning team members. The templates were also helpful in maintaining planning teams' focus on the goals of each planning step. To supplement template completion, planning team members developed digital maps of their communities. These maps were extremely helpful communication tools because they enabled the planning team to overlay areas that could be affected by hazards on top of critical buildings and infrastructure.

ARA and HUD recruited three volunteer communities, listed in the table below.

Exhibit ES 1. Volunteer Communities Recruited by ARA and HUD to Participate in This Effort

Community Name	Community Type	Hazards	Other
Mississippi Band of Choctaw Indians (MBCI)	Tribal Nation	• Tornado • Extreme heat	• Worked with largest community in east-central Mississippi
Southampton Township, New Jersey	Municipality	• Riverine flooding • Wildfire	• One-third of population lives in active adult community (55 years and older)
Burlington County, New Jersey	County	• Riverine flooding • Wildfire	• Contains 44 municipalities, including Southampton Township

ARA = Applied Research Associates, Inc.

ARA and HUD did not use a one-size–fits-all approach for demonstrating resilience planning for this effort. The amount of time required to develop a resilience plan varied by community. For example, ARA met virtually with the Southampton Township leader for approximately one hour every three weeks to discuss work completed and to introduce the next tasks in the planning

process. The Southampton Township leader used the time between meetings to engage other planning team members, as appropriate, and complete the next steps in the planning process. In contrast, ARA met with members of the MBCI planning team every week for an hour. These weekly working meetings enabled communication and collaboration between members of different tribal government departments. The benefit of meeting so frequently was that MBCI planning team members spent very little time outside of those working meetings on resilience planning. Both approaches were effective, and ARA worked with each community for about 1 year to complete their resilience plans.

Due to the relatively short length of these documents, communities have the flexibility to either use it as a standalone plan or incorporate it into other existing planning documents. For example, MBCI immediately incorporated its community resilience plan as an appendix to its comprehensive emergency management plan to ensure that both plans are updated in the same planning cycles. On the other hand, the Southampton Township planning team was concerned that combining the resilience plan with the hazard mitigation plan might cause its priorities to become lost in the additional required content. Therefore, Southampton Township opted to initially keep its community resilience plan as a standalone document but will reference its community resilience plans in other long-range plans and may incorporate it more directly into existing long-range plans in future iterations.

Southampton Township and MBCI both stated that the resilience planning process was helpful. The process forced local government staffers in different departments to talk about their responsibilities and assisted with communication. These communities developed good initial plans and learned what questions they need to address between now and the next iteration of their plans, so they can continue to improve their communities' resilience.

Burlington County did not produce a community resilience plan because of circumstances that arose during its resilience planning process. Working through Burlington County's partial process, HUD learned that counties and higher levels of government need a different approach from municipalities. Counties and other higher levels of government can act as facilitators, using guidance, such as the NIST Playbook, as a framework for working with municipalities to develop resilience plans. This approach is more appropriate in such situations because counties do not have the same access to the details of buildings and infrastructure as municipalities do.

One key finding of this effort was that a resilience leader must have the ability and time to push the planning process forward. The leader also needs to understand that the main benefit of resilience planning is communicating and collaborating with other local departments and stakeholders. The leader should also make every effort to engage planning team members with a diverse set of expertise.

An important outcome from this project is the development of a standard outline for a community resilience plan that can be used by smaller communities that lack extensive resources. Prior to this effort, no known templates or standard outline for a community resilience plan existed. Although some good community resilience plans do exist, many are lengthy. The goal was a straightforward basic outline that would result in a community resilience plan on the order of 20-30 pages for Southampton Township and MBCI.

This project demonstrated that resilience planning need not be limited to the largest, most well-resourced communities. However, communities require more assistance to get started. ARA can train HUD CDBG managers to apply the NIST Playbook or other similar tools, so they can

support communities incorporating resilience into their long-range plans. Short videos to assist communities with resilience planning, featuring content covered in the regularly scheduled virtual meetings for this effort, can also be used as training materials. Finally, although the playbook templates were effective for this effort, having more templates would better enable communities to capture demographics with a focus on vulnerable populations and brainstorming and prioritizing solutions to resilience gaps.

1. Introduction

The federal government and other organizations around the United States have conducted research in recent years that have resulted in the development of numerous guides intended to help communities become more resilience to hurricanes, floods, earthquakes, wildfires, tornadoes, and other hazards. However, less work has been done implementing these guidance documents and working directly with communities to gain a better understanding of the potential roadblocks that need to be addressed better.

Project Overview

In 2021, HUD funded the Community Resilience Planning for Disaster Recovery project to demonstrate approaches for integrating community resilience objectives and actions into existing long-range community planning documents. These long-range plans can include comprehensive plans, hazard mitigation plans, or consolidated plans, among others. Incorporating resilience into these long-range plans is of particular importance to HUD because it has various types of grant funds that seek to reduce the effects of natural disasters, including the Community Development Block Grant (CDBG), CDBG Disaster Recovery (CDBG–DR), and CDBG Mitigation (CDBG–MIT).

Many options are available for community resilience planning guidance and tools. For this effort, HUD used the National Institute of Standards and Technology (NIST) *Community Resilience Planning Guide for Buildings and Infrastructure Systems* (Guide) and its associated tools. The Guide documents a six-step planning process that was one of four tools HUD published in its 2016 final rule, *Modernizing HUD's Consolidated Planning Process to Narrow the Digital Divide and Increase Resilience to Natural Hazards.*[1] HUD partnered with personnel from the NIST Community Resilience Group and Applied Research Associates (ARA) to demonstrate the application of these tools in three communities. The partners used the NIST Playbook, which is a shorter, more action-oriented version of the Guide, along with several templates to assist communities working through the process (NIST, 2020a, 2020b).

ARA and HUD hosted an informational webinar in December 2021 to recruit communities to participate in this project. The goal was to work with communities in different geographic locations that experience different types of hazards. Three communities were selected for this effort:

- **Mississippi Band of Choctaw Indians (MBCI)**—a tribal nation with several small communities throughout Mississippi and Tennessee. The team worked with the largest MBCI community in central Mississippi. The nation's main hazard concerns are tornadoes and extreme heat.
- **Southampton Township, New Jersey**—a small rural municipality of approximately 10,000 people. Nearly 3,000 of whom live in an active adult community for residents 55 years old and older. Southampton Township's main hazard concerns are riverine flooding and wildfire.
- **Burlington County, New Jersey**—the county in which Southampton Township is located. It contains 44 municipalities, many with flood and wildfire concerns. Because detailed

[1] Modernizing HUD's Consolidated Planning Process to Narrow the Digital Divide and Increase Resilience to Natural Hazards, 24 CFR 91, 81 Fed. Reg. 242 (December 16, 2016). https://www.govinfo.gov/content/pkg/FR-2016-12-16/pdf/2016-30421.pdf.

information is required for a community to develop a resilience plan, working at the county level requires a different approach from working with municipalities.

Purpose of This Report

This report addresses important, practical questions that arise in community resilience planning to help communities incorporate resilience planning into long-range planning—either through a standalone plan that other plans reference or by merging resilience directly into existing long-range plans. The next section discusses the basics of resilience planning and its benefits. The third section informs community leaders and CDBG managers about the process at a high level. The fourth section summarizes important aspects of the resilience planning process and lessons learned from working with the selected communities. Although the report is based on the author's application of the NIST Playbook, this section is more general so that readers can incorporate the approach and lessons learned into other resilience planning approaches. Next, the report summarizes the author's findings and recommends future improvements that will simplify the resilience planning process for communities and CDBG managers. The final section includes recommendations for how this work should be disseminated to engage additional communities.

2. Getting Started With Resilience Planning

Before beginning resilience planning, communities must understand what *resilience* means, the benefits of resilience planning, the level of commitment required for success, the expected outcomes of the process, and the differences in approach depending on the type of community. This section explains the basics of resilience planning and helps communities get started on the process.

What Is Community Resilience, and What is the Benefit to Communities?

This report uses the Presidential Policy Directive/PPD-21 definition of resilience:

> The ability to prepare for and adapt to changing conditions and to withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents.[2]

Although many other definitions of resilience exist, the definition used for this effort is similar to that in other federal government documents, such as the *National Climate Resilience Framework* (White House, 2023).

In the United States, the number of natural disasters and the cost to recover from those events has increased in recent years, and experts predict this trend will continue. Historically, communities across the country have been *reactive* to disasters rather than *proactive*—that is, communities do not do enough work to mitigate and prepare for disasters. Neglecting such work results in significant disruptions to normal life and large federal financial investments—for example, funding from HUD and the Federal Emergency Management Agency (FEMA)—into rebuilding communities. In addition, administrative delays in getting federal government money to states, counties, and local communities may further prolong disruptions.

Resilience planning is planning for recovery. Resilience planning recognizes that a hazard (natural or manmade) may likely disrupt building and infrastructure system functionality in a community but focuses on taking action ahead of time to reduce disruptions and recovery time. By acting before a hazard occurs, local governments, residents, and businesses help themselves return to normal more quickly and rely less on outside sources for help with recovery. In short, resilience planning aims to take actions that prevent natural hazards from becoming natural disasters, thereby benefiting communities, businesses, and higher levels of government.

How Much Time Commitment Does Resilience Planning Require?

No set number of weekly hours is required for a community to complete its resilience planning. More important is that planning team members understand how much time they can realistically commit to resilience planning and define the scope of their process to make sure it is manageable. Resilience planning should be cyclical, making incremental improvements to reduce the recovery time from hazard events.

For example, Southampton Township and the Mississippi Band of Choctaw Indians (MBCI) adopted different approaches for resilience planning. Applied Research Associates (ARA) met

[2] Presidential Policy Directive—Critical Infrastructure Security and Resilience, PPD-21 (Feb. 12, 2013). https://obamawhitehouse.archives.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil.

virtually with the Southampton Township leader approximately every 3 weeks for an hour to discuss completed work and introduce the next tasks in the NIST community resilience planning process. Between the meetings, the leader completed those tasks and engaged other planning team members as needed. ARA also met weekly with members of the MBCI planning team for an hour. These working meetings fostered collaboration between members of different tribal government departments and enabled the team to invest very little effort outside those meetings.

ARA used these different approaches to meet the needs of each community. No single way is correct to do it, both approaches were effective. ARA worked with both communities for about a year to complete their resilience plans. The communities could have completed planning in a shorter time span, but breaks in planning enabled team members to attend to other priorities, including disruptions due to natural hazards. It is important to understand and accept that delays or interruptions in planning will happen.

How Long Are Resilience Plans?

Although each community had unique planning approaches and challenges, both wanted a plan that would be read or used. ARA's goal was to keep the main body of the resilience plans to no more than 20 to 30 pages, with the understanding that appendices might be needed. Some members of the MBCI planning team were even more ambitious: they wanted to develop short "go plans" of about 2 to 3 pages specific to each hazard. Although the resilience plans were 20 to 30 pages, the 2- to 3-page go plans were recommendations that came out of this process. In addition to making resilience plans much easier to read, keeping the length between 20 and 30 pages allows the community to incorporate them into other community plans with relative ease. However, it should be noted that for larger jurisdictions concerned with multiple hazards (for example, New York City and San Francisco), much longer resilience plans may be needed. In such cases, it would be beneficial to have an executive summary or abridged version so the plan will be quickly accessed.

How Does Resilience Planning Differ for Municipalities and Counties?

Stakeholders who participated in developing the NIST Playbook were concerned that it would be difficult for smaller communities to use. However, this effort demonstrated that the NIST Playbook is well suited for smaller communities. The size of Southampton Township and MBCI simplified collaboration across government departments because many government staffers knew each other and could engage others effectively. The smaller, rural nature of the communities made it straightforward to identify the buildings and infrastructure important to recovery because the planning teams had a good understanding of the services they provide.

Burlington County could not develop a resilience plan in the same way as one of their municipalities (for example, Southampton Township). Counties and higher levels of government possess different information available to them as municipalities. For example, Burlington County has 44 municipalities and could not reasonably gather the correct plan information in a practical timeframe. However, counties can act as facilitators, using a framework, such as the NIST Playbook, to work with their communities to develop resilience plans. For example, Boulder County, Colorado, took a similar approach through its *Resilient Design Performance Standard for Infrastructure and Dependent Facilities* (Boulder County CDBG-DR Collaborative, 2016). Boulder County set performance goals for the county and worked with each of its municipalities to set its own goals. Unincorporated areas or municipalities that did not develop their own performance goals were expected to meet the goals developed by the county.

Federally recognized tribes can use the NIST Playbook in a manner similar to a municipality or county. For this effort, the research team discussed both options with the MBCI planning team because the tribe has 11 communities and plays a role similar to a county. However, the MBCI planning team decided to complete resilience planning for their largest community, with the intent to expand it to their other communities later. Hence, they used the guidance in a manner similar to a municipality.

3. Working Through the Resilience Planning Process

This section summarizes the key aspects of the resilience planning process used for this project and the lessons learned. Although HUD used the National Institute of Standards and Technology (NIST) *Community Resilience Planning Guide and Playbook* (exhibit 3-1), the subsections provide a more general approach to resilience planning while referencing the steps of the NIST process. Each subsection includes additional questions that a community resilience team leader or Community Development Block Grant (CDBG) manager may ask when working through the planning process.

Exhibit 3-1. Guidance and Tools From the National Institute of Standards and Technology Demonstrated Incorporation of Resilience Into Long-Range Plans

Source: NIST (2016)

Building a Team

The first step to resilience planning is to assemble a planning team. This parallels *Step 1 – Form a Collaborative Planning Process* in the NIST Playbook.

Who Needs to Be Involved in Resilience Planning to Be Successful?

A Leader With Time to Commit to the Planning Process. Before any work begins, identify someone to lead and be responsible for the process. This leader can come from many different departments, such as emergency management, community development, public works, or others that are directly relevant to the resilience of buildings and infrastructure. Of utmost importance, the leader must have the capacity, such as time, to commit to pushing the planning process forward by engaging others in local government and the community. This aspect of planning needs particular consideration before beginning the process because many, if not most, local government staffers have competing priorities that can make it difficult to commit significant time to resilience planning. The leader should also have the ability to engage and facilitate collaboration among team members from other local government departments and nongovernment stakeholders.

A Core Planning Team. A primary benefit of community resilience planning is that it requires collaboration across different departments in local government. The communities with which HUD worked for this effort were small (populations less than 15,000). This choice was advantageous because the resilience leaders for these smaller local governments already had a good idea of whom they needed to engage in the process. Both Southampton Township and the

Mississippi Band of Choctaw Indians (MBCI) planning teams found working with members of other departments helpful because they learned more about others' roles and responsibilities. Not all core planning team members need to be involved in every aspect of the planning process; the leader must engage the others most often to get their input on what is important for the plan. Burlington County is not shown in exhibit 3-2 as counties and higher levels of government need to approach resilience planning differently than municipalities. For example, counties and other higher levels of government can act as facilitators, using guidance as a framework to work with municipal teams, such as those shown in exhibit 3-2, to help develop resilience plans.

Exhibit 3-2 summarizes the roles of the local government members involved in resilience planning for Southampton Township and the MBCI community. It is less important to focus on the number of participants on the planning team and more important to focus on the ability of the team members to provide the necessary input. Burlington County is not shown in exhibit 3-2 because counties and higher levels of government need to approach resilience planning differently than municipalities. For example, counties and other higher levels of government can act as facilitators, using guidance as a framework to work with municipal teams, such as those shown in Exhibit 3-2, to help them develop resilience plans.

Exhibit 3-2. List of Local Government Members Included on the Core Planning Team

Southampton, New Jersey	Mississippi Band of Choctaw Indians
• **Emergency Management Coordinators**	• **Development Division Director**
• Safety Coordinator	• Emergency Management Coordinator
• Public Works Supervisor	• Public Works Director
• School Principal	• Hospital Health Director
• Fire Chief and Deputy Chiefs	
• Firefighters	
• State Forest Fire Service Warden	
• LeisureTowne Firewise Committee Chair	

Note: Resilience leader roles are bold text in blue shaded table cells.

Community Stakeholders. In addition to local government staffers from other departments, planning teams should maintain a list of community stakeholders from whom the resilience leader needs to collect input. These stakeholders may be individuals who represent organizations (for example, businesses, schools, and hospitals). The resilience leader may not need to engage the community stakeholders in every aspect of the planning process, but the leader should engage community stakeholders when they may have valuable input or if they would be affected by recommendations in the plan. For example, the Southampton Township leader went door-to-door seeking input from residents living in an area that frequently floods. He asked specific questions about the flooding problem and what actions would help them. The leader also informed a regional oil and propane distributor that they had tanks in a floodplain and discussed potential solutions. Outreach and community engagement allows stakeholders to have input and obtain buy-in among the community, when possible.

The resilience leader can use NIST Playbook Template 1-1 to brainstorm and document which stakeholders need to be engaged in the planning process (NIST, 2020b).

Understanding the Community

After the resilience leader identifies the appropriate stakeholders and forms a planning team, the next step of resilience planning is to meet with the planning team and discuss the challenges

planning team members expect to face should a hazard occur. This step parallels to *Step 2–Understand the Situation* in the NIST Playbook.

Including planning team members from several departments who are familiar with community demographics as well as with buildings and infrastructure is important for these discussions. For example, members of emergency management, department of public works, hospitals, and schools could provide valuable input.

What Is the Community Most Concerned About in Case of a Disruptive Event?

Identifying the potential impacts and ramifications of a disaster that are most important to a community requires multiple perspectives, which is why building a planning team across local government departments, as described previously, is important in resilience planning. Early in the planning process, team members benefit from discussing which buildings and infrastructure systems are most important to keep the community functioning and which of those are subject to hazards. Such discussions should include whether team members expect any of the buildings or infrastructure to lose functionality and how long recovery is likely to take for a given hazard event. For this effort, the communities discussed transportation, energy, communications (i.e., telecom and internet), water, and wastewater. Playbook Template 2-1 was beneficial in guiding these conversations with MBCI and Southampton Township (NIST, 2020b).

Some communities engage consultants to assist with their resilience planning. When this is the case, having conversations guided by this template is a great starting point for both community planning team members and consultants, as the consultants are often not from that community and need to gain a better understanding of the community. For this project, the Applied Research Associates (ARA) staff were not near any of the communities to which they were providing guidance, placing ARA in a similar position to that of a consultant. When consultants work with communities, the staffers working on the resilience plan should travel to the community early in the process to gain a visual understanding of the community. For example, staffers can hold an in-person meeting to begin planning, including working through Template 2-1 and touring the community for further context. Traveling to the communities for this project happened late in the planning process due to restrictions associated with the coronavirus disease of 2019 (COVID-19), which was declared a pandemic. When travel to a community is not possible, maps and overhead imagery are useful to communicate the locations of critical buildings and infrastructure as well as locations of vulnerable populations.[3]

Although NIST developed Playbook Template 2-1 specifically for use with the planning process, it can be used with other resilience planning approaches (NIST, 2020b). When using this template, it is most effective when asking additional questions of the community resilience planning team, such as:

- With respect to the community's buildings and infrastructure systems, what keeps you up at night? (When this question was asked of the MBCI planning team, they feared losing the ability to provide water to their tribal members.)
- If you lose functionality of a building or infrastructure system, can you move the service it provides to a backup location? (When this question was asked of Southampton Township, it

[3] For this effort, vulnerable populations were defined as groups of individuals within a community whose needs may go unmet before or after a disaster event, including the elderly, people living in poverty, racial and ethnic minority groups, people with disabilities, and those suffering from chronic illness.

formalized a plan to use another building as a fire station should flooding affect the fire station that is near a floodplain. As part of this plan, another building in the township will be designated as the alternate fire station, and the team will develop procedures to move the fire trucks and other necessary equipment to this alternate location if needed.)

- Are you testing your backup plans and resources? How often? (When this question was posed to MBCI, it would use backup generators for their critical facilities; those generators are tested regularly.)
- What special consideration are you giving to vulnerable populations? What do they need to recover faster from disruptive events? Are there clusters of low-income populations or populations with disabilities in your community? (About one-third of Southampton Townships' population, including residents with disabilities, lived in an active adult community for residents 55 years and above. This group required special consideration in resilience planning.)

Having these conversations early in the planning process is extremely helpful to learn about the community, what concerns the planning team members had, and identify other concerns.

Hazards

When working with Southampton Township and MBCI, planning team members had significant knowledge about past events and how events affected services in the community. Identifying hazards parallels to *Step 3–Determine Goals & Objectives* in the NIST Playbook.

It is suggested to include planning team members with knowledge of past events in these discussions, including emergency managers, public works, first responders, schools, hospitals, and representatives with knowledge of the impact of those hazards from other local government departments. The subsections describe what communities should consider when identifying and selecting hazards for resilience planning.

How Can a Community Identify Its Hazards?

The goal of identifying hazards for a community resilience plan is not to plan for every hazard that could possibly affect a community. Rather, the goal is to start with a discussion of many hazards and select a few (i.e., 2–3 hazards) that the community is most concerned about and has the capacity to address. For future iterations of resilience planning, a community can always address additional hazards as needed.

For this project, each community completed Playbook Template 3-3 (NIST, 2020b). Exhibit 3-3 and exhibit 3-4, examples of completed NIST Playbook Template 3-3, show the hazards that Southampton Township and MBCI identified and discussed for inclusion in their resilience planning. For each hazard type, the community considered three hazard levels:

1. **Routine**—events with a high probability of occurring.
2. **Design**—events used in codes and standards for the design of buildings, bridges, and so on.
3. **Extreme**—events with a small probability of occurrence.

For the hazard levels in exhibits 3-3 and 3-4, it was impossible to adhere strictly to the definitions because of a lack of data available to the planning teams; however, the exhibits reflect realistic hazard levels for each type. The community planning teams based the hazard levels on judgment, which included reviewing other community plans (for example, Hazard Mitigation

Plans) to make sure those community plans were consistent with the following tables. The shaded rows in exhibits 3-3 and 3-4 show the hazards selected by Southampton Township and MBCI, respectively, for resilience planning.

Exhibit 3-3. Hazard Types and Levels Identified by Southampton Township

Hazard Type	Routine	Design	Extreme
Snow/Winter Storm	< 6 inches of snow	6–4 inches of snow	> 24 inches of snow
Thunderstorms	Marginal and Slight	Enhanced	Moderate or High
Rain	> 3 inches	3–6 inches	> 6 inches
Flood - Riverine	10-year flood return	100-year return period	> 500-year return period
Wind—Non-Hurricane	High winds	Strong winds	Derecho
Wind—Hurricane	N/A	Category) 1–2	Category 3–5
Earthquake	N/A	Magnitude 1–4	Magnitude > 5
Fire—Wildfire	Small brush fires	< 100 acres	> 100 acres
Fire—Urban	Fires in homes, businesses, or vehicles	Residential/commercial fires	Multi-structure fires
Drought	Drought watch	Drought warning	Drought emergency
Tornado	N/A	EF-0, EF-1	≥ EF-2
Extreme Heat/Heatwave	Heat index 80–90	Heat index 90–105	Heat index > 105
Hail	Dime size or smaller	Nickel to tennis ball	Tennis ball to softball
Extreme Cold/Windchill	Below freezing	Single digits	Below 0 degrees

EF = Enhanced Fujita. N/A = not applicable.
Note: Shaded rows represent selected hazards for resilience planning.
Source: Southampton Township (2024)

Exhibit 3-4. Hazard Types and Levels the Mississippi Band of Choctaw Indians Identified

Hazard Type	Routine	Design	Extreme
Tornado	EF-0, EF-1	EF-2	EF-3+
Flood—Riverine	100-year rainfall → flash flooding—culvert washouts	Multiday rainfall	
Excessive Heat (Brownouts)	100ºF for a week	110ºF for a week	110ºF for 10+ days
Wind—Hurricane	< 50 mph	50–60 mph	80 mph
Wind—Non-Hurricane	30–40 mph	50–60 mph	80 mph

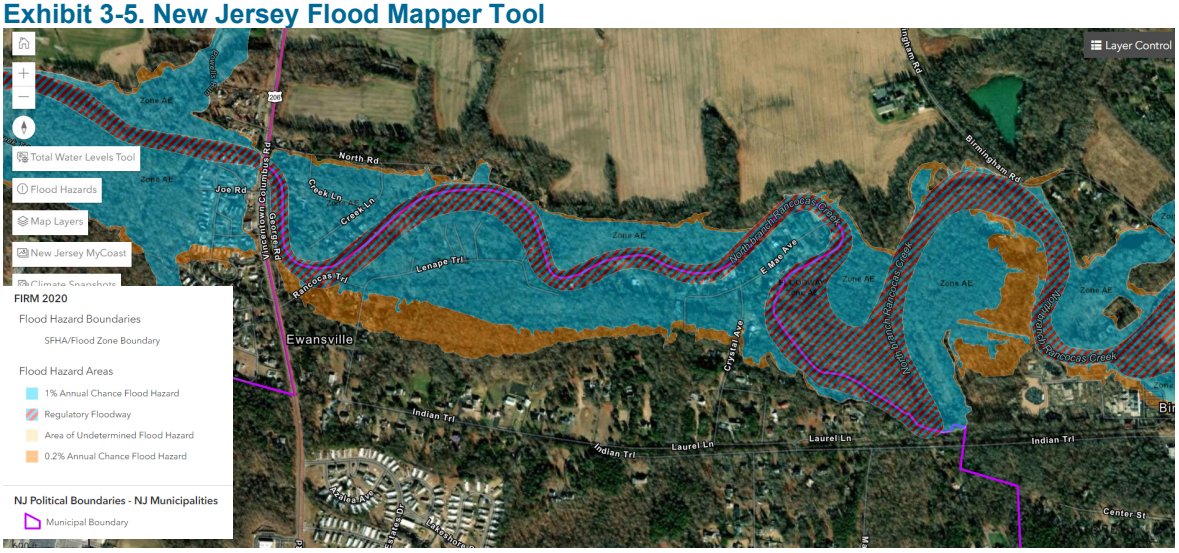
EF = Enhanced Fujita. mph = miles per hour.
Note: Shaded Rows Represent Selected Hazards for Resilience Planning.
Source: Mississippi Band of Choctaw Indians

As exhibits 3-3 and 3-4 show, the hazards considered by Southampton Township and MBCI were quite different overall, which reflects their different geographic locations in the US (northeast vs. southeast). The difference in hazards considered by Southampton Township and the MBCI illustrates that planning teams only need to consider relevant hazards, which vary by community.

How Does a Community Identify the Areas Impacted by Hazards?

Some hazards are defined through codes and standards, such as FEMA's 100- and 500-year flood maps.[4] Although some communities only possess paper or scanned versions of their flood maps, this project demonstrated that some states have developed tools to display FEMA flood maps digitally on overhead imagery. Southampton Township used the New Jersey Flood Mapper to overlay the 100- and 500-year floodplains onto overhead imagery to identify the number of buildings, including low-income homes, businesses, and other infrastructure that could be affected by floods (Rutgers University, 2024; exhibit 3-5).

Exhibit 3-5. New Jersey Flood Mapper Tool

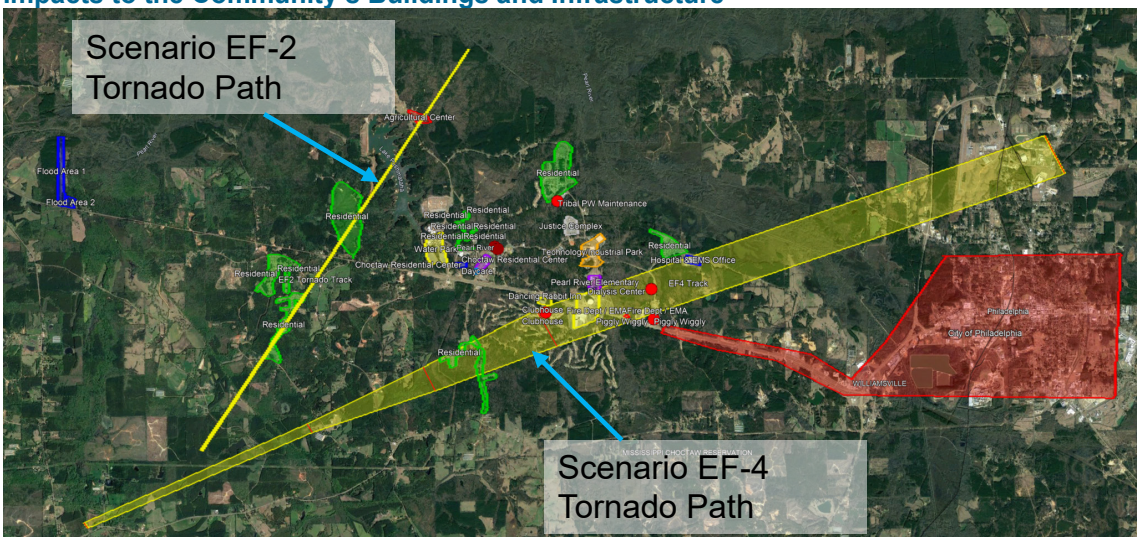


Note: The New Jersey Flood Mapper Tool was used to overlay the Federal Emergency Management Agency floodplain on overhead imagery in Southampton Township to better understand the risk to homes and businesses.
Source: Rutgers University (2024)

Earthquakes and hurricane wind loads are also defined thoroughly in codes and standards. Tornadoes, wildfires, and extreme heat are not as well defined for communities. Although the American Society of Civil Engineers (ASCE) Standard 7-22 recently added tornado risk maps, developing scenarios for planning cases was effective for our resilience planning efforts. For example, the MBCI defined two scenario tornadoes and overlaid those on overhead imagery of their largest community, Pearl River (exhibit 3-6). Again, these maps were extremely helpful tools in discussing the potential impacts on buildings and infrastructure systems for those scenarios and determine what those impacts meant for the community.

[4]A 100-year flood is not a flood that occurs once every 100 years. It is a flood that has a 1 percent annual chance of exceedance. Similarly, a 500-year flood is a flood that has a 0.2 percent annual chance of exceedance.

Exhibit 3-6. MBCI Developed Scenario EF-2 and EF-4 Tornadoes to Understand the Potential Impacts to the Community's Buildings and Infrastructure



EF = Enhanced Fujita. MBCI = Mississippi Band of Choctaw Indians.
Source: MBCI

Evaluating Buildings and Infrastructure Systems

As discussed previously, several approaches are effective in evaluating whether buildings and infrastructure systems are resilient. The author based the following discussion on the application of the NIST Playbook because HUD selected this approach for this effort. This section includes portions of *Step 3 – Determine Goals & Objectives* and *Step 4 – Plan Development* from the NIST guidance.

How Can a Community Evaluate the Resilience of its Buildings and Infrastructure Systems?

Each community's planning team developed and completed performance goals tables, keeping with NIST guidance. The largest effort required by communities is to complete the performance goals tables. The most important considerations when completing performance goals tables are:

- The resilience leader must understand how to use the performance goals tables.
- The performance goals tables must include different perspectives (i.e., more than one person should complete the tables).

Again, ARA used different approaches to work with Southampton Township and MBCI:

- **Southampton Township.** The resilience leader for Southampton Township completed the performance goals table to become comfortable with the process. Once comfortable, the resilience leader removed the performance goals he developed and facilitated meetings with the Southampton Township planning team members to obtain their input on the goals. The resilience leader held multiple meetings with small groups because many of the township government staffers were part time or volunteers, and their schedules would not align.
- **MBCI.** Because the MBCI planning team held weekly working meetings, they developed their performance goals together during those meetings.

The approaches of both Southampton Township and MBCI worked well. However, for a community that is working alone without any or with limited technical support, the Southampton

Township approach, where the resilience leader works through the performance goals on his/her own first to gain an understanding of the process, is preferred. Also, Southampton Township's resilience leader developed a strong understanding of the performance goals tables before engaging others in the process of completing the tables. Without developing an understanding of the performance goals tables, discussions with team members and stakeholders are likely to veer off topic.

Exhibit 3-7 shows an example of a completed performance goals table (not from either community that participated in this effort). For the Southampton Township and MBCI communities, the planning team's process for completing this table was:

1. Group buildings and infrastructure into clusters (i.e., categories that serve the same purpose, such as residential housing); list the clusters in the leftmost column.
2. Set desired recovery time goals (i.e., when the planning team *wants* buildings and infrastructure to recover). These goals do not consider the hazard type; they consider the hazard level (i.e., routine versus extreme). Note, that although the intent was to set the goals independent of hazard type, it became clear that planning team members had hazard types in mind when setting goals. Although such thoughts is human nature, users should be careful about focusing too much on a hazard when setting goals. For example, businesses may disregard what type of hazard affects a community as they need remain operational for revenue and can only withstand a disruption for a certain period before closing or relocating.
3. Choose one of the selected hazard levels and types (see exhibits 3-3 and 3-4).
4. For the chosen hazard, set the anticipated recovery times (i.e., when the team *thinks* buildings and infrastructure will recover if a hazard were to affect the community tomorrow).
5. Repeat #3 and #4 for each selected hazard.

The approach brings together the information discussed in the Understanding the Community and Hazards sections under Working through the Resilience Planning Process. The desired and anticipated recovery times were set based on judgment of the planning team members for both communities. Planning teams could also develop anticipated recovery times based on experience or using tools such as FEMA's Hazus damage and loss estimation tool (2023). Although the use of judgment is perfectly acceptable, especially for initial resilience plans, note that community members may tend to underestimate recovery time for extreme events. For example, although the MBCI planning team was in the process of identifying the anticipated recovery times for an EF-4 scenario tornado, an EF-4 tornado struck Rolling Fork, Mississippi, about 100 miles away from the community for which the performance goals were being completed. After that tornado, the MBCI planning team reconsidered their original anticipated recovery times and moved them further to the right in the performance goals tables, establishing longer recovery times.

Exhibit 3-7. Example Performance Goals Table for Building Clusters and Categories

Building Clusters	Design Hazard Performance								
	Phase 1: Short-Term			Phase 2: Intermediate			Phase 3: Long-Term		
	Days			Weeks			Months		
	0	1	1-3	1-4	4-8	8-12	4	4-24	24+
Critical Facilities									
Emergency Operation Centers	90%							X	
First Responder Facilities	90%							X	
Memorial Hospital	90%							X	
Non-ambulatory Occupants (prisons, nursing homes, etc.)	90%							X	
Critical Factory	90%							X	
Emergency Housing									
Temporary Emergency Shelters	30%	90%							X
Single and Multi-family Housing (shelter in place)	60%			90%					X
Housing/Neighborhoods									
Critical Retail		30%	60%	90%					X
Religious and Spiritual Centers			30%	60%	90%				X
Single and Multi-family Housing (full Function)			30%		60%		90%		X
Schools			30%	60%	90%				X
Hotels & Motels			30%		60%	90%			X
Community Recovery									
Businesses – Non-critical Factories				30%	60%	90%			X
Businesses - Commodity Services				30%	60%		90%		X
Businesses - Professional Services				30%		60%		90%	X
Conference & Event Venues				30%		60%		90%	X

Disturbance	
Hazard Type	Flood
Hazard Level	Design
Affected Area	Community
Disruption Level	Moderate

Cluster Recovery Levels	
30%	Minimal
60%	Functional
90%	Operational
X	Anticipated Performance

Source: NIST (2020a)

How Can a Community Reduce Resilience Gaps?

A *resilience gap* is the difference between a desired recovery time and an anticipated recovery time (i.e., the difference between the '90 percent' and 'X' in exhibit 3-7). Resilience leaders must understand that the largest gap may not necessarily be the highest priority. For example, a small gap (for example, inability to provide water to community members) may be much more disruptive than concert venues not being usable.

The process of completing these performance goals generated a lot of discussion among planning team members as well as with the ARA lead. Several planning team members began the planning process with opinions about the most important gaps. Although they were correct in their

concerns, using performance goals forced much broader discussions among planning team members that focused on the whole community, including discussions of how vulnerable populations could be affected. Discussing disasters in the context of recovery times rather than life safety, damage, and losses provided a different lens that led to identifying a broader range of potential solutions.

For example, Southampton Township has an active adult community that may be exposed to wildfire. The township has been working with that community to help with evacuating residents, including those with mobility issues and/or disabilities. However, these discussions resulted in the Southampton Township planning team recommending that the township works with LeisureTowne not just to evacuate the community in case of a wildfire but also to put a plan in place to recover quickly. This recommendation includes testing plans to understand challenges with temporary shelter, especially for those needing special accommodation.

MBCI, like much of the country, has a housing shortage. However, the tribe has a construction company that repairs damaged homes; tribal members are temporarily relocated when their homes are not habitable. In some cases, tribal members are relocated to another community because limited temporary housing is also available. MBCI planning team members identified this gap when discussing the resilience gaps. As a result, the planning team recommended renovating a dormitory at an existing school campus in the community for use as temporary housing once the new school, in the process of being built, opens.

The planning teams based the solutions they identified and recommended for reducing their resilience gaps on their discussions. For future iterations of the community's resilience plans, they can build on what they have done by using benefit-cost analysis tools such as the National Institute of Standards and Technology (NIST) Economic Decision Guide Software Online Tool, EDGe$ (NIST, 2020c).

Developing a Resilience Plan

The resilience leader should manage documenting the work completed by the planning team and seek approval from the appropriate local government authority (for example, town council). However, other planning team members can and should be involved in developing the plan, especially if they have expertise in certain areas or made significant contributions in the planning process. This section parallels *Step 5 – Plan Preparation, Review and Approval* of the NIST Playbook.

What to Include in a Resilience Plan

The resilience plan has no formal requirements. When working through the planning process with Southampton Township and MBCI, both planning teams asked the following questions:

- Is there a template for a community resilience plan?
- Are there examples of Community Resilience Plans?

Although ARA shared examples with each community, most were lengthy, and therefore, they were not very useful in developing a short resilience plan. To remedy, ARA developed an outline for a basic community resilience plan that met the requirements of both Southampton Township and MBCI. The outline is for smaller communities that understand the importance of resilience but do not have enough resources or the desire to develop a lengthy community resilience plan (exhibit 3-8). Both communities reviewed and agreed the outline was useful and would help

produce concise resilience plan. Further, this outline enables a planning team to incorporate their resilience plan into other community plans. Southampton Township's Community Resilience Plan is available on their website (Southampton Township, 2024).

Exhibit 3-8. Community Resilience Plan Outline Developed for Southampton Township and MBCI

Section	Heading	Description
1	Introduction	High-level introduction to community resilience and approach.
1.1	What is community Resilience and Why Is It Important?	Introduction to community resilience and benefit.
1.2	Coordination with Other Relevant Plans	List of other plans and brief discussion of how those plans are related to community resilience.
1.3	Process and Methodology	Introduction of the National Institute of Standards and Technology (NIST) Community Resilience Planning Guide and Playbook.
2	Assessing Community Resilience	Discussion of outcomes from planning efforts.
2.1	Identifying Vulnerable Populations	Discussion of demographics and vulnerable populations in the community including low-income, poverty, disabled, and age distribution.
2.2	Identifying and Defining Hazards	Discussion of hazard types and levels considered and selected.
2.3	Selected Hazards	Discussion of why hazards were selected and the risk they pose to the community, including maps (e.g., flood maps and scenario event maps).
2.4	Evaluating Buildings and Infrastructure	Discussion of performance goals from the NIST planning process, including performance goals tables with key findings.
3	Recommended Action to Improve Community Resilience	Summary of recommended actions for implementation.
3.1	Recommendations	List of recommendations and potential funding sources.
3.2	Tracking Progress	List of recommended actions in a table used to track progress.
Appendices	Varies	Templates completed by community in the resilience planning process.

MBCI = Mississippi Band of Choctaw Indians.
Source: Applied Research Associates, Inc.

Should It Be a Standalone Plan or Part of Another Plan?

As learned during this effort, either having a standalone community resilience plan that references and is referenced by other community plans or incorporating the resilience plan directly into other long-range plans was advantageous.

Southampton Township was updating their Hazard Mitigation Plan while developing their resilience plan. Even though commonalities were present in the planning processes and content for both plans, Southampton Township initially opted to keep the community resilience plan as a separate document. They wanted a short plan that captured what was most important to them and did not want those priorities lost within the more extensive content required to satisfy the requirements of their Hazard Mitigation Plan or other lengthy long-range plans.

MBCI, on the other hand, incorporated their Community Resilience Plan directly into the Comprehensive Emergency Management Plan (CEMP) as an appendix. MBCI requires their CEMP be reviewed every 2 years with minor updates, with an entire plan rewrite every 5 years. Incorporating the MBCI Community Resilience Plan into their CEMP ensures updates will occur in both documents on the same planning.

The approaches of Southampton Township and MBCI are both valid. Some communities may want to develop their initial community resilience plan as an individual document to help understand the process. This approach is especially helpful when the planning team wants a short planning document and the planning timeline does not match that of other long-range plans, such as a Comprehensive Plan, Hazard Mitigation Plan, or Consolidated Plan. However, other long-range plans should reference the community resilience plan, and communities should recommend incorporating the resilience plan into the preferred long-range plan. One way to incorporate resilience planning into a community's Comprehensive or Master Plan is to add a chapter or appendix that specifically focuses on community resilience.

Implementing a Resilience Plan

Once the Community Resilience Plan has been completed and approved, communities can use the recommendations section in the plan as a roadmap to begin implementation. This section parallels to *Step 6 – Plan Implementation and Maintenance* of the NIST Playbook.

Once the Plan Is Done, What Is Next?

The recommendations section of the resilience plan should identify who is responsible for implementing and updating the plan, including a progress tracker if the community follows the outline presented in exhibit 3-8. Each recommendation should include specific actions to improve the community's resilience. Note that in a good resilience plan, the recommended actions vary in the level of effort and resources required to implement. Some actions can be implemented with relative ease and may not require significant resources; communities should prioritize such actions for a short period of time. Other actions may be large-scale projects and require funding (for example, grants) from outside the community. The Southampton Township and MBCI recommendations both listed potential funding sources for each recommendation. Examples of funding sources include:

- HUD, CDBG.
- FEMA, Building Resilient Infrastructure and Communities (BRIC).
- FEMA, Pre-Disaster Mitigation (PDM) Grant Program.
- FEMA, Flood Mitigation Assistance (FMA).
- Environmental Protection Agency, Drinking Water State Revolving Fund.
- U.S. Department of Agriculture (USDA), Rural Development Water and Wastewater Loan and Grant Program (WWDLGP).
- Department of Energy, (DOE) Office of Indian Energy.
- Bureau of Indian Affairs, (BIA) Tribal Climate Resilience Program.

The recommendations within the resilience plan should contain sufficient detail for use as an implementation plan.

How Often Should a Community Resilience Plan Be Updated?

Communities should review and update community resilience plans frequently. The timeline for updates varies by community. Ideally, review the progress tracker every 1 to 2 years and complete a more comprehensive update of the full community resilience plan every 3 to 5 years. A community does not become resilient during only a few years. Rather, a community becomes resilient over time as the community demographics, services needed, buildings and infrastructure, and hazards change. Therefore, resilience planning is an iterative and ongoing process.

4. Findings and Recommendations

This section presents the findings from demonstrated resilience planning with the participating communities. Communities interested in resilience planning or Community Development Block Grant (CDBG) managers engaging their communities in resilience planning should review the findings in Section 4.1. The recommendations in Section 4.2 are offered to HUD to simplify resilience planning for communities. In addition, the research team include recommendations that focus on how to disseminate this report and case studies.

Findings

The following findings from this study are useful to communities considering resilience planning:

- **The resilience planning team leader should commit time to the planning process.** Leaders can come from many different departments, such as emergency management, development, public works, or others that are directly relevant to the resilience of buildings and infrastructure. No matter the department, the leader should have the capacity (such as time) to commit to pushing the planning process forward by engaging with persons in local government and the community. The leader should also engage and facilitate collaboration among team members from other local government departments and nongovernment stakeholders.
- **A community can use different approaches to work through the planning process.** Applied Research Associates (ARA) met virtually with the Southampton Township leader nearly every 3 weeks for an hour to discuss completed work and introduce the next task(s) in the National Institute of Standards and Technology (NIST) community resilience planning process. Between meetings, the leader completed tasks discussed in the most recent meeting and engaged other planning team members as needed. Similarly, ARA met with members of the Mississippi Band of Choctaw Indians (MBCI) planning team every week for an hour. These working meetings fostered collaboration between members of different tribal government departments and resulted in relatively little time spent on engagement outside of the meetings.
- **Communities want short plans.** Both Southampton Township and MBCI agreed that they wanted their resilience plans to not exceed 30 pages, even shorter if possible. To the planning team members of both communities, long plans are not used in the way they are intended; it is easier to incorporate a short plan into other long-range plans. Large communities with multiple hazards may desire longer plans. In such a case, an executive summary or abridged plan should be developed for an easier read.
- **The NIST Playbook is well suited for small communities.** The size of Southampton Township and MBCI (populations less than 15,000) made collaboration across government departments relatively easy because many of the government staffers already knew one another, and the leaders were able to engage others effectively. The smaller size of these communities also made it straightforward to identify the buildings and infrastructure systems that are important to recover because the planning teams already had a good understanding of the services they provide.
- **Counties need to take a different approach to resilience planning.** Working with Burlington County demonstrated that counties do not have the same level of detail about communities available to them as municipalities, and, even if they did, it is a large

undertaking (for example, Burlington County has 44 municipalities). However, counties can act as facilitators, using guidance like the NIST Playbook as a framework to develop resilience plans. Boulder County, Colorado, used this approach successfully (Boulder County, Collaborative, 2016). Because federally recognized tribes tend to have multiple communities and the detailed information required to plan for those communities, they can use either the municipality or county approach.

- **Maps are extremely helpful tools for resilience planning.** Southampton Township and MBCI both developed digital maps to identify critical building and infrastructure locations. MBCI also developed maps to communicate tornado scenarios for planning. Both communities constantly referenced these maps in discussions about the hazards and recovery goals.
- **Templates are helpful to communities working through a resilience planning process.** For this effort, research team used templates associated with the NIST Playbook (NIST, 2020a, 2020b). These templates helped focus discussions among planning team members and assisted with collecting necessary data to complete resilience planning.
- **Communities want more templates and examples of good community resilience plans.** Most of the planning process was driven by completing Playbook templates (NIST, 2020b) for each step. The communities favored this approach and asked for more templates. A standard outline/template of a community resilience plan along with sample plans using the template are needed because communities do not understand exactly what a resilience plan should look like and templates simplify plan development for busy local government representatives. ARA developed an outline of a community resilience plan with input from the communities (exhibit 3-8).

Recommendations

HUD should consider the following recommendations to facilitate resilience planning for communities:

- Provide technical assistance to communities in learning the resilience planning process and incorporating resilience planning into long-range plans, and properly train personnel providing the technical assistance (contractors, consultants, or CDBG managers) on application of the NIST Community Resilience Planning Playbook or similar tools.
- Develop short training videos to assist communities with resilience planning. These videos can include content covered in the regularly scheduled virtual meetings that ARA provided to the communities during this effort.
- Create additional templates. In addition to the established templates, other potentially useful templates should:
    - Capture community demographics with a focus on vulnerable populations.
    - Develop maps for communicating critical building and infrastructure, and hazards.
    - Brainstorm and prioritize solutions to resilience gaps (the author developed a template for this effort, which needs improvement).
    - Assist communities with setting priorities.

HUD should also consider the following recommendations on disseminating this report and case studies:

- Strategically attend conferences widely attended by communities to promote this report and case studies.
- Create a series of webinars to share what HUD learned through this project. These webinars would engage communities directly, similar to the informational webinar HUD held at the beginning of this project to engage communities in this effort. For example, webinars could be hosted for the Community Compass Technical Assistance program applicants (HUD, 2023).
- Set up meetings between HUD Headquarters personnel and regional and/or local field office personnel to communicate the results of this study, giving local CDBG managers an opportunity to ask questions and better understand the resilience planning process.
- Develop training materials and sessions for regional and local field office CDBG managers to understand the process of resilience planning. Training sessions should include opportunities to improve on the process by gathering input on local challenges, opportunities, sources of funding, and so on.
- Engage the HUD Office of Native American Programs (ONAP) to provide the information sessions and training described previously. Personnel from the regional ONAP office attended an HUD Headquarters in-person meeting with MBCI. Those personnel appreciated the resilience work being done and felt that other federally recognized tribes would be interested and benefit from it.

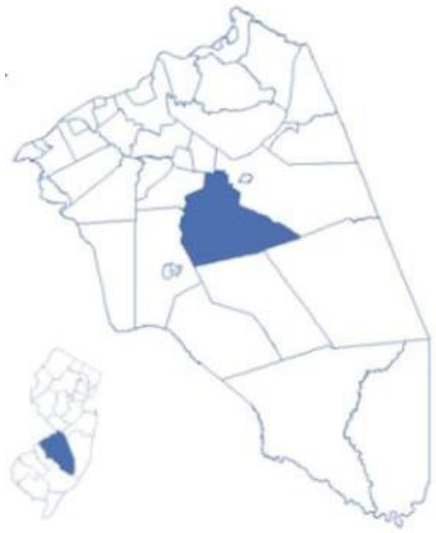
Appendix A. Southampton Township Case Study

Case Study: Southampton Township, New Jersey Develops Community Resilience Plan to Address Flooding and Wildfire

Introduction to Southampton Township

Southampton Township is a rural community in south-central Burlington County, New Jersey (exhibit A-1). It is home to 10,317 residents. This population includes 3,209 people in an active adult community for residents aged 55 and above named LeisureTowne. The township includes a historic downtown in Vincentown, farmland, and three-fourths of the township is within the Pineland Preserve, a protected natural area of unique ecology that covers more than 1 million acres in New Jersey.

Exhibit A-1. Southampton Township Is in Burlington County, New Jersey



Source: Southampton Township (2024)

Why Was Southampton Township Interested in Community Resilience Planning?

Southampton Township sits on two branches of Rancocas Creek: the North and South branches. Southampton has 376 buildings in the 500-year floodplain, 340 of which are in the 100-year floodplain of the creek. As shown in exhibit A-2, the North Branch has experienced flooding in 2004, 2011, and 2019. The South Branch of the creek, which runs through Vincentown, has experienced flooding in 2004, 2007, 2011, 2014, and 2019.

Exhibit A-2. Floods in Southampton Township Since 2000

Year	Branch	Cause of Flood	Highest Flood Level
2004	North and South	13 inches of rainfall leading to dam failures	1,000-year flood
2007	South	Nor'easter producing 6 inches of rainfall	50-year flood
2011	North and South	Hurricane Irene producing 5–8 inches of rainfall	100-year flood
2014	South	6 inches of rainfall	30-year flood
2019	North and South	5 inches of rainfall	100-year flood

Source: Southampton Township (2024)

In addition to flooding, wildfire is a concern because most of the township's land is within the Pineland Preserve. During 2023, at least seven wildfires were greater than 100 acres in size in Burlington County. Wildfire is of particular concern in Southampton because of the large elderly population in LeisureTowne, which includes people with disabilities and mobility challenges.

What Did Southampton Township Use to Develop Its Community Resilience Plan?

Many options are available when it comes to community resilience planning guidance and tools. For this effort, HUD selected the National Institute of Standards and Technology (NIST) *Community Resilience Planning Guide for Buildings and Infrastructure Systems* (Guide) and its associated tools. The Guide includes a six-step planning process that was of particular interest to HUD because it is one of four tools included in HUD Rule 24 CFR Part 91 *Modernizing HUD's*

Consolidated Planning Process to Narrow the Digital Divide and Increase Resilience to Natural Hazards. The township used a NIST Playbook, which is a shorter, more action-oriented version of the Guide, along with several templates for communities to work through the process. The Guide and Playbook include six steps:

- Step 1: Form a Collaborative Planning Team.
- Step 2: Understand the Situation.
- Step 3: Determine Goals and Objectives.
- Step 4: Plan Development.
- Step 5: Plan Preparation, Review, and Approval.
- Step 6: Plan Implementation and Maintenance.

Although the township used the NIST Playbook for this effort, planning teams can incorporate the lessons learned into other resilience planning approaches, as well.

Building a Team

Who Was Involved in Southampton Township's Community Resilience Plan?

Southampton Township's resilience leader was the emergency management coordinator for the township. The core planning team also included:

- Safety coordinator.
- Public Works supervisor.
- School principal.
- Fire chief.
- Deputy Fire and Emergency Squad chiefs.
- Deputy Emergency Management coordinators.
- Zoning Board member.
- State forest fire service warden.
- LeisureTowne Firewise Committee chair.

One of the main benefits of community resilience planning is that it requires collaboration across different departments in local government. Southampton Township is a small community, which turned out to be an advantage in building a team because the resilience leader knew who he needed to engage in the planning process.

How Much Time Did Southampton Township's Staff Spend on Community Resilience Planning?

Applied Research Associates (ARA) met virtually with the Southampton Township resilience leader approximately every 3 weeks for an hour for nearly 12 months. During these meetings, completed work was discussed and new tasks in the NIST community resilience planning process were introduced. Between meetings, the resilience leader completed the tasks introduced at the previous meeting and engaged other planning team members as needed. Southampton Township could have completed planning more quickly, but the resilience leader needed some breaks in the process to work on competing priorities, including disruptions due to flooding in the township. Planning teams should expect interruptions in the planning process.

Planning teams should also understand that the township government jobs of the resilience leader and many other planning team members are part-time. Many of the people in these roles have

other full or part-time jobs, as is the case in many small towns across the country. Therefore, a challenge the resilience leader faced when trying to engage planning team members was that their schedules often did not align. To remedy, the resilience leader held multiple smaller group meetings rather than a single, large meeting for all team members.

Understand the Community

How Did Southampton Township Begin to Identify Its Biggest Concerns in Case of a Disruptive Event?

Southampton Township used Playbook Template 2-1 to guide conversations about which buildings and infrastructure systems are most important to keep the community functioning and to determine which of those buildings and infrastructure systems are subject to hazards. For this effort, the team discussed buildings, transportation, energy, communications (i.e., telecom and internet), water, and wastewater (exhibit A-3). This process was especially useful for the ARA staff that were not from the community. Although the ARA team would have benefited from travel to the community early in the project, that was not possible due to restrictions of the COVID-19 pandemic.

Exhibit A-3. Snippet of Playbook Template 2-1 Used to Guide Conversations About Buildings and Infrastructure in Southampton Township

Buildings:

- Identify critical buildings (fire, police, call centers, Emergency Operating Center, shelters, etc.) and government owned buildings (government offices, courts, libraries, etc.).
- Determine which buildings are subject to community hazards.
- Which buildings will be damaged such that they can no longer meet their intended function?
- How long will it take to repair damage to restore functions (days, weeks, months, years)? (supports specifying anticipated performance).
- For how long does the community want this service to be interrupted (days, weeks, months)? (supports specifying desired performance goal).

Note: Similar questions are included in the template for transportation, water, wastewater, energy, and communications.

Using the template in combination with a community visit would have been the ideal way to gain a better understanding of the community early in the project. Instead, the resilience leader developed several maps that identified where critical buildings and infrastructure were located and which hazards could potentially impact each. Maps proved to be an extremely useful communication tool in learning about and understanding the township. Using templates and generating maps to guide the conversation are good practices because planning team members from different departments will have different perspectives the team should consider during planning.

Hazards

What Hazards Did Southampton Identify for Inclusion in Its Plan?

Southampton Township completed Playbook Template 3-3 to identify hazards that might cause disruptions to their community (exhibit A-4). The planning team considered three different levels of hazards: routine (a level the team expects to reach at a specific location about once in a decade), design (a level the team expects to reach at a specific location about once in a lifetime), and extreme (a level the team expects to reach at a specific location only once during several lifetimes). The team identified hazard levels based on their judgment and a review of other plans,

such as their county Hazard Mitigation Plan, for consistency. From the hazards identified in exhibit A-4, the planning team selected flooding and wildfire (such as the shaded rows) for resilience planning because of the frequency of flooding and sizable vulnerable population that could be impacted by wildfire. Southampton Township may expand their resilience plan to include additional hazards in the future.

Exhibit A-4. Hazard Types and Levels Identified by the Planning Team

Hazard Type	Routine	Design	Extreme
Snow/Winter Storm	< 6 inches of snow	6–24 inches of snow	> 24 inches of snow
Thunderstorms	Marginal and Slight	Enhanced	Moderate or High
Rain	> 3 inches	3-6 inches	> 6 inches
Flood—Riverine	10-year return period	100-year return period	> 500-year return period
Wind—Non-Hurricane	High Winds	Strong Winds	Derecho
Wind—Hurricane	N/A	Cat 1-2	Cat 3-5
Earthquake	N/A	Magnitude 1-4	Magnitude > 5
Fire—Wildfire	Small brush fires	< 100 acres	> 100 acres
Drought	Drought Watch	Drought Warning	Drought Emergency
Tornado	N/A	EF-0 to EF-1	≥ EF-2
Extreme Heat/Heatwave	Heat Index 80-90	Heat Index 90-105	Heat Index > 105
Hail	Dime size or smaller	Nickel to Tennis Ball	Tennis Ball to Softball
Extreme Cold/Windchill	Below freezing	Single digits	Below 0

Cat = category. EF = Enhanced Fujita. N/A = not applicable.
Note: Highlighted rows represent selected hazards for resilience planning.
Sources: Southampton Township (2024); Rutgers University (2024)

How Did Southampton Township Evaluate the Areas Impacted by Flooding and Wildfire?

Southampton Township used the New Jersey (NJ) Flood Mapper to overlay the Federal Emergency Management Agency (FEMA) 100- and 500-year floodplains onto overhead imagery to identify the land area, population, number of buildings, and estimated replacement value in floodplains (Rutgers University, 2024; exhibit A-5).

Exhibit A-5. Flood Exposure in Southampton Township

Floodplain	Land (Acres)	Population	# of Buildings	Replacement Value
100-year	5,260	258	141	$227M
500-year	5,347	288	156	$233M

Source: Southampton Township (2024)

Southampton Township used the New Jersey Wildfire Risk Explorer portal to identify its structure exposure risk in the township.[5] The team identified LeisureTowne as the biggest concern for wildfires because one-third of the township's population lives there, including many elderly and disabled individuals.

[5] New Jersey Wildfire Risk Explorer portal: https://wrap.newjerseywildfirerisk.com/Map/Public#map-themes.

Evaluate Buildings and Infrastructure

How Did Southampton Township Identify Resilience Gaps of Its Building and Infrastructure Systems?

Using the NIST guidance, the Southampton Township planning team developed and completed the performance goals tables using Playbook Templates 3-1 and 3-2. The resilience leader for Southampton went through the process of completing the performance goals table on his own to become comfortable with the process. Once comfortable, the resilience leader removed the performance goals he developed and facilitated meetings with planning team members to get their input on the goals. The resilience leader held multiple meetings with small groups because many of the township government staffers were part-time or volunteers and they could not all align their schedules. The process of completing performance goals was:

1. The planning team grouped buildings and infrastructure into clusters (i.e., categories that serve the same purpose, such as housing or education).
2. The planning team set desired recovery time goals (i.e., when the planning team wants buildings and infrastructure to recover). These goals do not consider the hazard type, only the hazard level (i.e., routine versus extreme).
3. The community selected one hazard level and type.
4. For the chosen hazard, the planning team determined the anticipated recovery times (i.e., when they think building and infrastructure will recover).
5. The planning team then repeated bullet point number 4 for each cluster, hazard type, and hazard level.

Southampton Township set its goals based on judgment of the planning team members.

How Does Southampton Township Plan to Reduce Their Resilience Gaps?

A resilience gap is the difference between a desired recovery time and an anticipated recovery time. The Southampton Township planning team reviewed the performance goals tables and identified the resilience gaps that concerned them the most—which were not necessarily the largest gaps. The planning team brainstormed potential solutions to reduce the gaps over time. Exhibit A-6 shows the gaps and potential solutions.

Exhibit A-6. Potential Solutions to Resilience Gaps Developed By Southampton Township

Priority	Resilience Gap Description	Potential Solutions
1	Residential housing subject to flooding, including areas with vulnerable populations.	• Engage people living in floodplains, especially vulnerable populations, to understand how the township can help them recover from floods faster. • Develop recreational areas that can double as either flood protection or flooded plains with little impact/damage. • Engage state program to see if buyout land can be used to build flood protection or water storage.
2	Residential housing subject to wildfire.	• Develop evacuation and recovery plan for LeisureTowne. • Ensure enough temporary shelter is available in case LeisureTowne is impacted by building more temporary shelter or developing agreements with nearby communities.
3	Emergency services/public safety could be affected by flood or wildfire.	• Identify and document backup facilities for fire stations and emergency medical services. • Test relocation to backup facilities annually.
4	Oil and propane distributor for the region has an oil or propane tank in 100-year floodplain.	• Work with owner to ensure oil and propane tanks are relocated from floodplain or adequately protected from floodwater (e.g., construction of vegetated berm).

Source: Applied Research Associates, Inc

Developing a Resilience Plan

What Is Included in Southampton Township's Resilience Plan? How Long Is the Plan?

Southampton Township developed a basic and straightforward outline for their community resilience plan. The author developed the outline in exhibit A-7 to be simple such that it met the Southampton Township's needs while being useful for other communities. The plan is about 30 pages in length, remaining readable and usable.

Exhibit A-7. Outline for Southampton Township Resilience Plan

Section	Heading	Description
1	Introduction	High-level introduction to community resilience and approach
1.1	What is community resilience and why is it important?	Introduction to community resilience and benefit.
1.2	Coordination with Other Relevant Plans	List of other plans and brief discussion of how those plans are related to community resilience.
1.3	Process and Methodology	Introduction to the National Institute of Standards and Technology (NIST) Community Resilience Planning Guide and Playbook.
2	Assessing Community Resilience	Discussion on the outcomes of the planning efforts.
2.1	Identifying Vulnerable Populations	Discussion on demographics and vulnerable populations in the community, including low-income, poverty, disabled, and age distribution.
2.2	Identifying and Defining Hazards	Discussion of hazard types and levels considered as well as those selected.
2.3	Selected Hazards	Discussion of reasoning behind hazard selection and the risks hazards pose to community, including maps (e.g., flood maps and scenario event maps).
2.4	Evaluating Buildings and Infrastructure	Discussion of performance goals from NIST planning process, including performance goals tables with key finding.
3	Recommended Action to Improve Community Resilience	Summation of recommended actions for implementation.
3.1	Recommendations	List of recommendations and potential funding sources.
3.2	Tracking Progress	List of recommended action in a table used to track progress.
Appendices	Varies	Templates completed by community in resilience planning process.

Source: Applied Research Associates, Inc

Is Southampton Township's Community Resilience Plan a Standalone Plan?

Southampton Township developed their initial Community Resilience Plan in parallel with their Hazard Mitigation Plan, incorporating some of the same information into both plans. Nonetheless, Southampton Township decided to keep their community resilience plan as a standalone plan. They wanted a short plan to capture what was important to the community and such priorities would not get lost within the content of a lengthy long-range plan. However, the resilience leader did leave the option open for incorporating future iterations of the resilience plan into other community plans.

Implementing the Resilience Plan

What Are the Next Steps for Southampton Township?

Southampton Township will follow the recommendations section of their community resilience plan, including producing a list of proposed actions to support the recommendations and potential sources of funding. The resilience leader and planning team will set priorities and develop a projected timeline for implementing the proposed actions. In the interim, some actions

may be implemented if they are "low-hanging fruit" that do not require significant resources. For longer-term actions that require outside funding, the first step will be to identify the appropriate opportunities to apply for funding (for example, grants).

How Will Southampton Township Monitor Its Progress on Implementing the Plan?

A progress tracker was included in the last section of the Community Resilience Plan. Although empty in the initial version of the resilience plan, this progress tracker is useful for updates every couple of years to understand how implementation is going and identify actions to revisit in terms of timeline.

Helpful Resources Referenced in This Case Study

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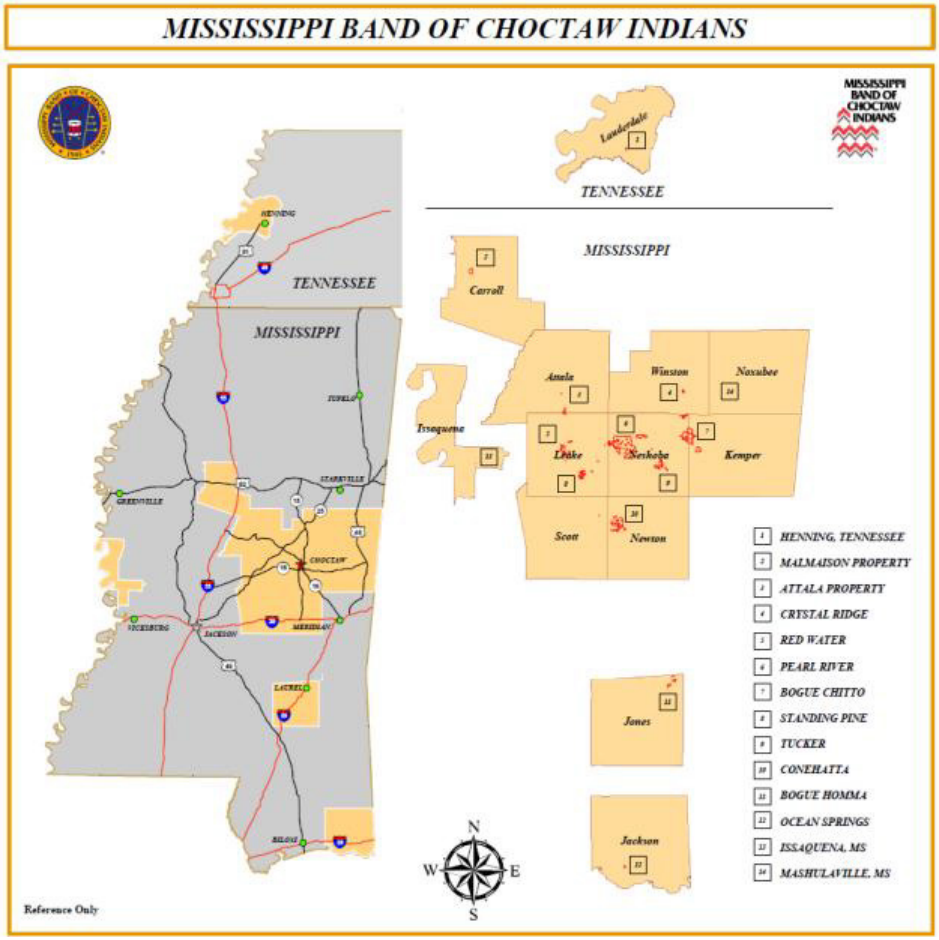
Appendix B. Mississippi Band of Choctaw Indians Case Study

Case Study: Mississippi Band of Choctaw Indians Develop Community Resilience Plan to Address Tornado, Flooding, and Extreme Heat

Introduction to the Mississippi Band of Choctaw Indians

The Mississippi Band of Choctaw Indians (MBCI) is a federally recognized Indian tribe. The MBCI has 11,000 enrolled members in 14 communities across 13 counties (exhibit B-1). Pearl River, the largest tribal community, has a population of about 7,000 and is in Neshoba County, just west of Philadelphia, Mississippi. This effort focused on community resilience planning for Pearl River, with the intent to extend the planning to other MBCI communities.

Exhibit B-1. Communities of the Mississippi Band of Choctaw Indians



Notes: The Mississippi Band of Choctaw Indians (MBCI) has eight communities across Mississippi and one in Tennessee. Pearl River is in Neshoba County, Mississippi.
Source: MBCI (n.d.)

Why Was the MBCI Interested in Community Resilience Planning?

Pearl River is in Neshoba County in east central Mississippi. The MBCI's main hazard concern is tornadoes. MBCI personnel have experienced several close calls, with tornadoes stopping

before reaching Pearl River or touching down after passing over Pearl River. During this planning effort, an EF-4 tornado (on March 24, 2023) struck Rolling Fork, Mississippi, which is about 100 miles west of Pearl River. The tornado damaged or destroyed much of the town, killing 17 people and injuring at least 165 others.

Additional MBCI concerns include extended heat waves and minor flooding. A large portion of the MBCI population, such as those of advanced age or with health issues, is vulnerable to extreme heat, and tribal members with health issues live in the area affected by flooding, which isolates 10–20 homes from the rest of the community, which is especially critical in emergencies.

A major MBCI housing shortage has resulted in many multi-generational homes and a shortage of temporary housing for use when damaged homes are not livable during repairs. This lack of temporary housing often forces temporary tribal member relocation to other communities throughout the Mississippi. This shortage in permanent housing has caused the MBCI Tribal Chief to focus on expanding housing in Pearl River and other tribal communities.

What Did MBCI Use to Develop Its Community Resilience Plan?

Many options are available when it comes to community resilience planning guidance and tools. For this effort, HUD selected the National Institute of Standards and Technology (NIST) *Community Resilience Planning Guide for Buildings and Infrastructure Systems* (Guide) and its associated tools. The Guide includes a 6-step planning process that was of particular interest to HUD because it is one of four tools included in HUD Rule 24 CFR Part 91 *Modernizing HUD's Consolidated Planning Process to Narrow the Digital Divide and Increase Resilience to Natural Hazards.* MBCI used a NIST Playbook, which is a more concise and action-oriented version of the Guide, along with several templates for communities to work through the process. The six steps included in the Guide and Playbook are:

- Step 1: Form a Collaborative Planning Team.
- Step 2: Understand the Situation.
- Step 3: Determine Goals and Objectives.
- Step 4: Plan Development.
- Step 5: Plan Preparation, Review, and Approval.
- Step 6: Plan Implementation and Maintenance.

Although MBCI used the NIST Playbook for this effort, planning teams can incorporate the lessons learned into other resilience planning approaches, as well.

Building a Team

Who Was Involved in MBCI's Community Resilience Plan?

The MBCI resilience leader was the Development Division Director. She formed a core planning team that included:

- Emergency management coordinator.
- Public Works director.
- Hospital health director.

Although this planning team is small, the team members had considerable experience and knowledge that enabled them to discuss a broad array of topics relating to the performance of

buildings and infrastructure on tribal lands. The team also engaged other tribal government members when they needed information from other departments.

How Much Time Did MBCI's Staff Spend on Community Resilience Planning?

ARA met with members of the MBCI planning team for an hour each week for nearly 12 months. These working meetings fostered collaboration between members of different tribal government departments. The planning team dedicated very little time to this effort outside those meetings. MBCI could have completed planning in a shorter time span, but the team scheduled some breaks in the planning process to attend to other competing priorities, including disruptions in service to their infrastructure. Planning teams should expect occasional interruptions in the planning process.

Understand the Community

How Did MBCI Begin to Identify Its Biggest Concerns in Case of a Disruptive Event?

The MBCI planning team used Playbook Template 2-1 to guide conversations about what buildings and infrastructure systems are most important to keep the community functioning and most vulnerable to hazards. For this effort, buildings, transportation, energy, communications (i.e., telecom and internet), water, and wastewater were all discussed (exhibit B-2). This process was especially useful for the ARA staff, who were not from the community. Although it would have been beneficial to travel to the community early in the project, that was not possible due to restrictions of the COVID-19 pandemic. Using the template in combination with a community visit would have been the ideal way to gain a better understanding of the community early on in the project. Instead, members of the planning team developed a digital map using Google Earth that identified where housing, critical buildings and infrastructure were in Pearl River. Maps proved to be an extremely useful communication tool in learning about and understanding Pearl River. It is good practice to use templates and generating maps to guide the conversation because planning team members from different departments have different perspectives and can contribute different information that should be considered in the planning process.

Exhibit B-2. Snippet of Playbook Template 2-1

Buildings:

- Identify critical buildings (fire, police, call centers, Emergency Operating Center, shelters, etc.) and government owned buildings (government offices, courts, libraries, etc.).
- Determine which buildings are subject to community hazards.
- Which buildings will be damaged such that they can no longer meet their intended function?
- How long will it take to repair damage to restore functions (days, weeks, months, years)? (supports specifying anticipated performance).
- For how long does the community want this service to be interrupted (days, weeks, months)? (supports specifying desired performance goal).

Notes: The Playbook Template was used to guide conversations about buildings and infrastructure in the Mississippi Band of Choctaw Indians community. Similar questions are included in the template for transportation, water, wastewater, energy, and communications.
Source: NIST (2020b)

Hazards

What Hazards Did MBCI Identify for Inclusion in Its Plan?

The MBCI planning team completed Playbook Template 3-3 to identify hazards that may cause disruptions to their community (exhibit B-3). They considered three different levels of hazards: routine (a level the team expects to reach at a specific location about once in a decade), design (a level the team expects to reach at a specific location about once in a lifetime), and extreme (a level the team expects to reach at a specific location only once during several lifetimes). The team identified hazard levels based on their judgment and a review of other plans, such as their tribal Hazard Mitigation Plan, for consistency. From the hazards identified in exhibit B-3, the planning team chose tornado, flood, and excessive heat/brownouts (i.e., the shaded rows in exhibit B-3) for resilience planning. Tornado was the predominant hazard of concern to the planning team, as east central Mississippi has a relatively high frequency of tornadoes. The team selected excessive heat because of the trend toward hotter and longer heat waves, especially across the southern United States. The MBCI planning team may expand their resilience plan to include additional hazards in the future.

Exhibit B-3. Hazard Types and Levels the Mississippi Band Choctaw Indians Planning Team Identified

Hazard Type	Routine	Design	Extreme
Tornado	Enhanced Fujita (EF)-0, EF-1	EF-2	EF-3+
Flood—Riverine	100-year rainfall → flash flooding—culvert washouts	Multiday rainfall	
Excessive Heat (Brownouts)	100ºF for a week	110ºF for a week	110ºF for 10+ days
Wind—Hurricane	< 50 miles per hour (mph)	50–60 mph	80 mph
Wind—Non-Hurricane	30–40 mph	50–60 mph	80 mph

mph = miles per hour.
Note: Highlighted Rows Represent Selected Hazards for Resilience Planning.
Source: MBCI (n.d.)

How Did MBCI Evaluate the Areas Impacted by Tornado, Flooding, and Extreme Heat?

Although the American Society of Civil Engineers (ASCE) recently added tornado risk maps to the ASCE Standard 7-22, scenario-based planning was a more intuitive option for MBCI's resilience planning efforts. The MBCI planning team defined two scenario tornadoes and overlaid those on the Google Earth maps they used to identify the critical buildings and infrastructure in Pearl River. The first scenario was an Enhanced Fujita (EF)-2 tornado that passed through residential areas only. The second scenario was an EF-4 tornado that passed through the main part of Pearl River that housed the most critical services, such as tribal government buildings, a hospital and dialysis center, grocery store, and elementary school.

The planning team used the Federal Emergency Management Agency (FEMA) flood maps to assess the flood hazard in Pearl River. Although the team does not expect flooding to damage buildings or homes, it would prevent emergency services from accessing a neighborhood known to have a population that is elderly and/or has health issues.

The planning team handled excessive heat differently because it would affect the entire community. For excessive heat, the main concern was a widespread loss of power due to brownouts and the effect that would have on the elderly and others with health issues. Instead of

hazard maps, the team developed maps of vulnerable populations to plan for deploying cooling stations or transportation to those cooling stations.

Evaluate Buildings and Infrastructure

How Did MBCI Identify Resilience Gaps of Its Building and Infrastructure Systems?

Following the NIST guidance, the planning team developed performance goals tables using Playbook Templates 3-1 and 3-2. The planning team developer performance goals during the weekly working meetings ARA held with the MBCI planning team for 1 to 2 months. Although ARA staff facilitated the discussions, the performance goals tables included only input from the MBCI planning team members. A good approach when a community fills out these performance goals for the first time without outside assistance, the resilience leader completes a first draft of the performance goals tables to understand the process. Then, the resilience leader meets with their planning team to lead them through the process of completing the tables.

The process of completing performance goals was:

1. The planning team grouped buildings and infrastructure into clusters (i.e., categories that serve the same purpose, such as housing or education).
2. The planning team set desired recovery time goals (i.e., when the planning team wants buildings and infrastructure to recover). These goals do not consider the hazard type, b only the hazard level (i.e., routine versus extreme).
3. The community chose one selected hazard level and type.
4. For the chosen hazard, the planning team determined the anticipated recovery times (i.e., when they think building and infrastructure will recover).
5. The planning team then repeated bullet point number 4 for each cluster, hazard type, and hazard level. For extreme heat, the team only completed performance goals tables for energy because the main concern was loss of power. Because flooding was very localized, the team did not complete performance goals tables to address that hazard.

The MBCI planning team set goals based on judgment of the planning team members. Although the use of judgment is perfectly acceptable, community members may tend to underestimate recovery time for extreme events. While identifying the anticipated recovery times for an EF-4 scenario tornado in Pearl River, an EF-4 tornado struck Rolling Fork, Mississippi, about 100 miles away from Pearl River. After that tornado, the MBCI planning team reconsidered their original anticipated recovery times and assigned longer expected recovery times in their community.

How Does MBCI Plan to Reduce Their Resilience Gaps?

A resilience gap is the difference between a desired recovery time and an anticipated recovery time. The MBCI planning team reviewed the performance goals tables and identified the resilience gaps that concerned them the most, which were not necessarily the largest gaps. For each gap, the planning team brainstormed potential solutions to reduce those gaps over time. Exhibit B-4 summarizes a few of their primary resilience gaps and potential solutions to reduce those gaps.

Exhibit B-4. Potential Solutions to Resilience Gaps the MBCI Planning Team Identified

Priority	Resilience Gap Description	Potential Solutions
1	Replace/update water system, including treatment plant and pumps.	Develop plan for short-term solutions if the Tribe loses ability to provide water to tribal members, for example putting a contract in place with a company to provide water trucks to supply water.
2	Missing data on demographics.	Complete demographics study to have better understanding of tribal members and how built environment supports them.
3	Look for opportunities to increase housing built to improved building codes and standards.	Adopt model building codes and amend to include practices above code that mitigate against tornado damage. Examples include using ring-shank nails for roof deck connections and hurricane straps for roof to wall connections.
4	Look for opportunities to expand temporary housing in Pearl River.	Develop plan to renovate dormitory at existing school campus so it can be used for temporary housing once new school is built.
5	Identify backup options to keep tribal Fleet fueled in case of loss of Welcome Center.	Put agreement in place with other local gas stations that prioritize fuel for tribal fleet in case of an emergency. Add a generator to Welcome Center.
6	Eliminate nuisance flooding from Isaac Lane that cuts off access to 10 to 20 households for days.	Complete hydraulic analysis and raise road by 2 to 3 feet.
7	Develop and test plans to help vulnerable populations in extended heat wave (i.e., elderly, those with health conditions).	Document short plan on where cooling stations will be established, using data on where vulnerable populations live.
8	Many of the generators providing backup power are old and need replacing.	Develop plan for retiring and replacing generators.
9	Engage tribal members to better understand wants and needs.	Hold community meetings to plan what new Pearl River would look like if ever affected by a tornado.

MBCI = Mississippi Band of Choctaw Indians.
Source: MBCI (n.d.)

Developing a Resilience Plan

What Is Included in MBCI's Resilience Plan? How Long Is the Plan?

The MBCI planning team developed a basic and straightforward outline for their community resilience plan. The outline in exhibit B-5 is general and can be used by other communities. The plan is about 30 pages in length, which remains readable and usable.

Exhibit B-5. Outline for the Mississippi Band of Choctaw Indians Resilience Plan

Heading	Description
Introduction	High-level introduction to community resilience and approach.
What is Community Resilience and Why is it Important?	Introduction to community resilience and benefit.
Coordination with Other Relevant Plans	List of other plans and brief discussion of how those plans are related to community resilience.
Process and Methodology	Introduction of the National Institute of Standards and Technology (NIST) Community Resilience Planning Guide and Playbook.
Assessing Community Resilience	Focuses on the outcomes of the planning efforts.
Identifying Vulnerable Populations	Discussion of demographics and vulnerable populations in community including low-income, poverty, disabled, and age distribution.
Identifying and Defining Hazards	Discussion of hazard types and levels considered as well as those selected.
Selected Hazards	Discussion of why hazards were selected and risk they pose to community, including maps (e.g., flood maps, scenario event maps, etc.).
Evaluating Buildings and Infrastructure	Discussion of performance goals from NIST planning process, including performance goals tables with key finding.
Recommended Action to Improve Community Resilience	Summary of recommended actions for implementation.
Recommendations	List of recommendations and potential funding sources.
Tracking Progress	List of recommended action in a table used to track progress.
Appendix	Templates completed by community in resilience planning process.

Source: Applied Research Associates, Inc

Is MBCI's Community Resilience Plan a Standalone Plan?

MBCI developed their community resilience plan for incorporation directly into their Comprehensive Emergency Management Plan (CEMP) as an appendix. The team must review their CEMP every 2 years with minor updates and rewrite the entire plan every 5 years. The MBCI planning team incorporated their community resilience plan into the CEMP to ensure updates on the same planning cycle as the CEMP.

Implementing the Resilience Plan

What Are the Next Steps for MBCI?

The MBCI will follow the recommendations section of their community resilience plan, which includes a list of proposed actions to support those recommendations and potential sources of funding. The MBCI planning team must set priorities and a projected timeline for implementing the proposed actions. In the near-term, some actions can be implemented with relative ease and may not require significant resources. For longer-term actions that require outside funding, the

team must first identify the appropriate opportunities to apply for that funding (for example, grants).

How Will MBCI Monitor Its Progress on Implementing the Plan?

The planning team included a progress tracker in the last section of the community resilience plan. Although empty in the initial version of the resilience plan, the planning team will use this progress tracker for updates every couple of years to understand how implementation is going and identify actions they need to revisit in terms of timeline.

Helpful Resources Referenced in This Case Study

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Appendix C. List of Acronyms

- **ARA.** Applied Research Associates, Inc.
- **ASCE.** American Society of Civil Engineers.
- **BIA.** Bureau of Indian Affairs.
- **BRIC.** FEMA's Building Resilient Infrastructure and Communities.
- **CDBG.** Community Development Block Grant.
- **CDBG-MIT.** Community Development Block Grant Mitigation.
- **CDBG-DR.** Community Development Block Grant Disaster Recovery.
- **CEMP.** Comprehensive Emergency Management Plan.
- **CFR.** Code of Federal Regulations.
- **COVID-19.** Coronavirus Disease 2019.
- **DOE.** United States Department of Energy
- **EF.** Enhanced Fujita Scale. Used to assign a tornado a rating based on wind speed and associated damage.
- **EOC.** Emergency Operating Center.
- **EPA.** United States Environmental Protection Agency.
- **FEMA.** Federal Emergency Management Agency.
- **FMA.** FEMA's Flood Mitigation Assistance.
- **Guide.** The NIST Community Resilience Planning Guide for Buildings and Infrastructure Systems.
- **HUD.** United States Department of Housing and Urban Development.
- **MBCI.** Mississippi Band of Choctaw Indians.
- **NIST.** National Institute of Standards and Technology.
- **PD&R.** HUD's Office of Policy Development and Research.
- **PDM.** FEMA's Pre-Disaster Mitigation Grant Program.
- **PE.** Professional Engineer.
- **PPD.** Presidential Policy Directive.
- **USDA.** United States Department of Agriculture.
- **WWDLGP.** Water and Waste Disposal Loan and Grant Program.

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