NIAC The National Infrastructure Advisory Council

REIMAGINING DISASTER RESPONSE AND RESILIENCY

December 2024

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About the NIAC

The President's National Infrastructure Advisory Council (NIAC or the Council) is composed of senior executives from industry and state and local government who own and operate the critical infrastructure essential to modern life. The Council was established by executive order in October 2001 to advise the President on practical strategies for industry and government to reduce complex risks to the designated critical infrastructure sectors.

At the President's request, NIAC members conduct in-depth studies on physical and cyber risks to critical infrastructure and recommend solutions that reduce risks and improve security and resilience. Members draw upon their deep experience, engage national experts, and conduct extensive research to discern the key insights that lead to practical Federal solutions to complex problems.

For more information on the NIAC and its work, please visit: https://www.cisa.gov/niac.

1. Executive Summary

Natural disasters are growing in frequency and severity. Threats from malignant actors affecting our critical infrastructure are rising. The Reimagining Disaster Response and Resiliency Subcommittee heard from nearly 50 experts from across the United States (U.S.) on aspects of disaster response, hazard mitigation, recovery, and resiliency. Our top recommendations below represent essential steps to strengthening our nation's preparedness and response capabilities and increasing resiliency to disasters.

1.1. Align FEMA's Mission with Funding Levels

The Federal Emergency Management Agency (FEMA) is being asked to do too much – much of it outside its traditional role, such as facilitating response to the viruses West Nile and COVID-19. FEMA is being activated for about one major disaster declaration every three to four days while simultaneously managing hundreds of older open disasters. This pace is taking its toll both in funding and on the workforce. FEMA's Disaster Relief Fund (DRF), through which it helps people and communities after a disaster, has frequently run on fumes. FEMA's staffing for some emergency cadres dipped below 25% of the strength needed in 2017; in October and November 2024, some cadre staffing dropped below 5%. FEMA personnel are burnt out from constant deployments and the agency has challenges recruiting and retaining staff. The current situation is unsustainable. FEMA is not able to successfully carry out all the duties expected of it given current funding levels. Either additional funding should be provided, or its mission set should be refined.

1.2. Engage Americans in Disaster Readiness by Providing Better Awareness of Future Hazards and Arming Americans with the Ability to Prepare for and Insure against Disasters

Many briefers to the Subcommittee mentioned that FEMA has become the "insurer of last resort." That is, households and communities are relying on FEMA assistance to make them whole after a disaster. But, at best FEMA assistance is a helping hand, and for a limited time. A homeowner impacted by a disaster gets an average of $5,000 from FEMA – not enough to pay for most disaster losses. The U.S. Small Business Administration (SBA) provides loans that must be paid back.

Decades of experience show that people and communities fare better after a disaster if they have insurance. However, insurance for wildfires, earthquakes, floods, and other perils is increasingly unavailable or unaffordable. Insurance and reinsurance companies are dropping policies and departing various regions as the number and severity of disasters increase. The Federal government should work with state governments to improve the insurance market. States are key as, aside from the National Flood Insurance Program (NFIP), insurance is regulated at the state level.

- A nationwide public service campaign is essential to educate people that FEMA cannot fully restore their losses after a disaster and to clarify FEMA's role in recovery.
- The NIAC recommends that Federal agencies providing immediate disaster assistance create a single, simple to use system to assist disaster survivors.
- The Federal government should work with state governments to improve the insurance market. States are key as, aside from the NFIP, hazard insurance is state regulated.
- FEMA and the NFIP should encourage all homeowners, landlords, and infrastructure owners to buy flood insurance. An insurance pool cannot remain viable if it only includes those most likely to file

claims. Doing so would reduce the amount of money that Congress needs to allocate to bail out the program every few years. Currently, the NFIP has a $20.5 billion debt to the U.S. Department of the Treasury (USDT). Attempts to make the NFIP actuarily sound have coastal homeowners reeling at the higher costs.

- The Government-Supported Enterprises (GSE) Federal National Mortgage Association (Fannie Mae) and Federal Home Loan Mortgage Corporation (Freddie Mac) manage a total housing portfolio of over $7.5 trillion. GSEs should require all properties in their portfolio purchase flood insurance. Currently flood insurance is required only if the property is in the floodplain. This change can potentially dramatically increase the risk pool and make the program economically sustainable.

1.3. Share Accountability and Responsibility for Disaster Response and Resiliency

All the major players in disaster response need to increase capability.

- The Federal government should raise the disaster threshold. This will place a greater responsibility for disaster response and resiliency on states. Before raising the disaster threshold, the Federal government should review previous studies and attempts to address it. In addition, the review should consider that a catastrophic event in a rural area may fall below the new threshold and potentially not receive Federal aid. The review should also consider if the disaster threshold should be a sliding scale. The NIAC notes that the President does have discretion under the Stafford Act to declare a Presidential disaster and thereby release Federal funding, whether the disaster threshold is met or not.
- The NIAC recommends that Federal agencies other than FEMA should be proficient in incident management, so that this burden does not always fall on FEMA when a national crisis or emergency (e.g., COVID-19) occurs. To accomplish this, the NIAC recommends that Homeland Security Directive-5 and Presidential Policy Directive 44 (PPD-44) be reissued to emphasize the practices that have made FEMA a pre-eminent disaster response agency, i.e., the National Incident Management System (NIMS) and Incident Command System (ICS).
- The NIAC recommends that state, local, Tribal, and territorial (SLTT) governments receive more Federal funding to enhance preparedness. The Emergency Management Performance Grant (EMPG) is the basic funding block for local emergency management. However, EMGP has not kept pace with inflation for the last 12 years. The NIAC recommends that EMPG funding be raised and that performance requirements are tied to funding.

Disaster preparedness and response may become a national security concern. Cyberattacks, especially attacks on infrastructure, are rising. If there is a National Security Emergency where there are multiple, simultaneous attacks on the U.S. infrastructure, the Department of Defense (DOD) will be fully engaged, perhaps overseas, in its core mission of national defense. FEMA and states may have to rely on their own capacity to handle the response and recovery. As DOD has provided almost 50% of staffing for some catastrophic incidents, raising the national capacity to handle large disasters can be a deterrence to our enemies.

1.4. Build a Better, More Resilient America

Most American infrastructure is 50-100 years old or older and was awarded a low grade by the American Society of Civil Engineers (ASCE). And, by some estimates, there is a shortage of three to seven million

homes nationwide. In the next several decades, America will require an investment of billions and perhaps trillions of dollars to build new roads, energy grids, water systems, housing, and other infrastructure. The NIAC recommends implementing policies to build a 21st century, better and more resilient America that also reduces the burden of paying for disaster losses.

- The NIAC recommends that the Federal government reinforce the importance of building codes. Current building codes are designed for life safety and do not protect against major economic losses. The NIAC recommends that the National Institute of Standards and Technology (NIST) and standards bodies such as the ASCE define resilient building codes for each critical infrastructure. Standards (such as ASCE 73) take a long time to become codes and then be adopted by SLTT governments, and the NIAC recommends that the Federal government assist in expediting this transition.
- The NIAC recommends that the Federal government consider a tax deduction for homeowners and landlords that upgrade housing to meet resiliency codes. Every dollar invested in mitigation reduces future damages by $6.
- The NIAC recommends that the Federal government make disaster programs more streamlined and flexible. The NIAC recommends that FEMA's premier disaster recovery program, Public Assistance (PA), be turned into a block grant. We recommend that the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) be made a standing program so there are no delays in starting long-term recovery after disasters. Aside from reducing the complexity and delays associated with the current system, these two actions will allow SLTT governments to combine Federal funds more easily with their own funds and private sector funding to mount resiliency initiatives.
- The NIAC recommends that the Federal government review ways to encourage public-private partnerships (P3) in infrastructure development. The Subcommittee heard from a group representing 110 of the leading global infrastructure investors, amounting to a combined worth of $2 trillion in infrastructure investments across 68 different countries. The U.S. consistently ranks as the best place to invest in private infrastructure investment; however, the nation's patchwork of P3 regulations makes such projects difficult to implement.

1.5. Enhance Disaster Response and Resiliency Through the Use of Data and Technology

Disaster response and resiliency programs are slow in adopting new technologies. The Subcommittee heard about an exception that shows the value of using new technologies. Massive wildfires have taken lives, destroyed housing and infrastructure, and burnt hundreds of thousands of acres. Leveraging a 20-year camera dataset from the wildlands, one jurisdiction is using artificial intelligence (AI) to rapidly locate and control small fires, preventing them from growing. The Federal government should encourage and facilitate data collection and the use of modern technology – such as tracking wind or water impacts on disaster, delivering effective public warning for fast-breaking events, and managing infrastructure with asset management technologies such as digital twinning.

Furthermore, the Subcommittee is not the only entity focusing on changes to the disaster response and resiliency system. Numerous legislative efforts across the 117th and 118th Congresses underscore the need to reform disaster assistance, disaster recovery, and resiliency. There are currently eight active bills in the

118th Congress, many sponsored by legislators from states that have suffered many recent disasters, including Florida, Louisiana, Oklahoma, Mississippi, Kentucky, and North Carolina.

1.6. Table Summary of Findings and Recommendations

Category	Findings	Recommendations
FEMA Mission and Disaster Funding	• FEMA is asked to do too much. • The current disaster funding process is unsustainable.	• Properly resource FEMA's DRF for the desired mission set. • Transform FEMA's PA Program into a block grant. • Review existing studies to increase the disaster threshold. • Optimize EMPG funding to strengthen and increase SLTT capability. • Make CDBG-DR and Community Development Block Grant – Mitigation (CDBG-MIT) permanent programs.
Workforce and Capacity	• FEMA has critical workforce shortages. • Nationwide capacity for disaster response is insufficient.	• Implement a whole-of-nation surge force. • Strengthen the disaster workforce to meet demand.
Disaster Recovery and Resilience	• Recovery programs are complicated and do not promote resiliency. • Programs like FEMA's PA and HUD's CDBG-DR are slow and fragmented. • There is a lack of a cohesive resiliency strategy to include housing issues and repetitive loss properties. • Infrastructure standards do not support resiliency. • Private sector faces roadblocks to investing in infrastructure.	• Develop a comprehensive national resiliency strategy. • Approve CDBG-DR earlier in a disaster to coordinate with PA. • Incentivize resilient housing, infrastructure, and mitigation investments. • Assess and invest in nature-based solutions. • Revise tax codes for mitigation incentives. • Encourage public-private initiatives for resilience.
Survivor Services	• Programs are slow, fragmented, and inequitable. • Vulnerable populations and Tribal nations face significant challenges.	• Better prepare Americans for Disaster Readiness. • Integrate survivor services at Federal levels. • Address needs of access and functional needs populations. • Assist preparedness and recovery efforts for Tribal nations.
Lifeline Coordination	• Lifeline sector collaboration is insufficient.	• Promote cross-sector collaboration and advanced modeling tools for cascading impacts. • Integrate NIMS/ICS into national critical functions (NCF).
Insurance Issues	• Insurance is becoming inaccessible or unaffordable in some regions.	• Encourage all homeowners to purchase flood insurance.

	• Insurance payments for public buildings are problematic.	• Encourage SLTTs to investigate and invest in innovative insurance models.
Use of Data & Technology	• Emergency management lags in technology and data utilization.	• Accelerate use of data and technology in emergency management.

2. Introduction

2.1. The NIAC's Charge

The National Security Council tasked the NIAC Reimagining Disaster Response and Resiliency Subcommittee with the following:

> *Reimagining the Federal Government's Approach to Disaster Response*.
>
> *The NIAC will identify ways the Federal government can better prepare and support communities as they find themselves in a continuous, comprehensive, and multi-phased response and adjustment mode to emerging climate hazards and hybrid threats:*
>
> - *How should the Federal government evolve its role in inclusive disaster response and resilience given the increasing frequency, range, and impact of threats and hazards faced by communities?*
> - *What resources will state, local, Tribal, and territorial governments need to become more resilient in the face of climate hazards and other emerging threats?*
> - *How can the Federal government incentivize state, local, Tribal, and territorial governments to rebuild and modernize infrastructure to the highest codes and leading practices to enhance its security and resilience?*
>
> - *How can the Federal government work with local elected officials to ensure full understanding of the problem and appropriate investment in training emergency personnel?*

2.2. Subcommittee Activities

The Subcommittee held the following meetings and received the following briefings from key stakeholders, thought leaders, and practitioners:

March 7, 2024 – The Subcommittee held an administrative discussion.

March 21, 2024 - The Subcommittee received a briefing from the following:

- Darryl Oliveira, former Manager, Administrator, Maui Emergency Management Office; HPM Building Supply Safety and Internal Control

March 28, 2024 - The Subcommittee received briefings from the following:

- Michael Byrne, Specialist Executive, Deloitte; Federal Coordinating Officer (FCO), FEMA (Former)
- David Warrington, Regional Administrator, FEMA Region 2
- John Rabin, Assistant Administrator for Response, FEMA

April 4, 2024 - The Subcommittee received briefings from the following:

- Robert Fenton, Regional Administrator, Region 9, FEMA
- Tony Robinson, Regional Administrator, Region 6, FEMA
- Jeffery Rupert, Director, Office of Wildland Fire, U.S. Department of the Interior (DOI)

April 18, 2024 - The Subcommittee received a briefing from Russell J. Strickland, Secretary of Emergency Management, Maryland.

April 25, 2024 - The Subcommittee received a briefing from Stephanie Dobitsch, Assistant Administrator, National Preparedness Directorate, FEMA.

May 2, 2024 – The Subcommittee held an administrative discussion.

May 9, 2024 - The Subcommittee received a briefing from Luis Vance Taylor, Chief, Office of Access and Functional Needs (OAFN), California Governor's Office of Emergency Services.

May 16, 2024 - The Subcommittee received a briefing from Mary Comans, Chief Financial Officer, FEMA.

May 23, 2024 - The Subcommittee received briefings from the following:

- Melanie Pattenaude, Logistics Section Chief, Emergency Management and Preparedness, Indiana Department of Homeland Security
- Scott Gauvin, Manager of Strategic Operations and Preparedness, Illinois Emergency Management Office

May 30, 2024 – The Subcommittee held an administrative discussion.

June 6, 2024 – The Subcommittee held an administrative discussion.

June 13, 2024 - The Subcommittee received briefings from the following:

- Jordan Nelms, NIMS Assistance Team Leader, Office of Response and Recovery, FEMA
- Christopher Currie, Director, Homeland Security and Justice, U.S. Government Accountability Office

June 20, 2024 - The Subcommittee received a briefing from Mark Ledbetter, National Exercise Support & Outreach Branch Chief, National Exercise Division, FEMA.

June 27, 2024 - The Subcommittee received briefings from the following:

- Mike Icardi, Director, Continuous Improvement Program, National Preparedness Directorate, FEMA
- Josh Stankus, Senior SLTT Engagement Lead, Cybersecurity and Infrastructure Security Agency (CISA)

July 11, 2024 - The Subcommittee received a briefing from Stephanie Koeshall, Principal Director for Homeland Defense Integration and Defense Support of Civil Authorities (DSCA), Office of the Under Secretary for Policy, U.S. DOD.

July 18, 2024 - The Subcommittee held an overview discussion on the topic of resiliency.

July 25, 2024 - The Subcommittee received a briefing from Derrick Hiebert, Assistant Administrator, Hazard Mitigation Directorate, Office of Resilience, FEMA.

August 1, 2024 - The Subcommittee received a briefing from Marion McFadden, Principal Deputy Assistant Secretary, Community Planning and Development, HUD.

August 8, 2024 - The Subcommittee received briefings from the following:

- Dan Kaniewski, Managing Director, Public Sector, Marsh McLennan; (Former) FEMA Deputy Administrator for Resilience & Acting Deputy FEMA Administrator
- Roy Wright, President & CEO, Insurance Institute for Business & Home Safety (IBHS); (Former) Deputy Associate Administrator for Insurance and Mitigation, FEMA
- Nicole C. Austin, Senior Vice President and Director of Federal Affairs, Reinsurance Association of America

August 15, 2024 - The Subcommittee received briefings from the following:

- Puesh M. Kumar, Director, Office of Cybersecurity, Energy Security, and Emergency Response (CESER), U.S. Department of Energy (DOE)
- Robert Pesapane, Director, PA, Office of Recovery, FEMA

August 22, 2024 - The Subcommittee received briefings from the following:

- Fernando Gil-Ensenat, (Former) Executive Director & Chairman, Board of Directors for the Puerto Rico Electric Power Authority (PREPA); (Former) Secretary, Puerto Rico Department of Housing (Vivienda)
- Neal Rackleff, (Former) Director, Housing and Community Development Department, City of Houston; (Former) Assistant Secretary, Community Planning and Development, HUD

August 29, 2024 - The Subcommittee received briefings from the following:

- Laura Adcock-Elder, Disaster Recovery Branch Chief and PA Officer, Ohio Emergency Management Division
- Emily Bentley, Recovery and Mitigation Section Chief, South Carolina Emergency Management Division
- Maggie Steenberg, Assistant Director, Department of Emergency Management, Miami-Dade County
- Herman Sanchez, Tribal Administrator, Santo Domingo Pueblo with Phoebe Suina, High Water Mark Consulting
- Jeff Hansen, Senior Director, Community Protection, Choctaw Nation

September 5, 2024 - The Subcommittee received briefings from the following:

- Sarah Saadian, Senior Vice President of Public Policy, National Low Income Housing Coalition
- Thom Amdur, Senior Vice President, Affordable Housing Tax Credit Coalition.

September 12, 2024 - The Subcommittee received briefings from the following:

- Jiqiu "JQ" Yuan, Ph.D., Chief Resilience Officer & Head of Engineering, National Institute of Building Sciences
- Aspasia "Sissy" Nikolaou, Ph.D., Earthquake Engineering Group Leader, Materials and Structural Systems Division, NIST

September 19, 2024 - The Subcommittee received a briefing from Robert Pesapane, Director, PA Division, FEMA.

September 26, 2024 - The Subcommittee received briefings from the following:

- Elijah J. Williams, Chief of Staff, Harris County Flood Control District

- Suzanna Randall, Chief Resiliency Officer, New York State Department of Environmental Conservation
- Kim Tyrrell, Associate Director, Environment, Energy & Transportation, National Conference of State Legislatures

October 3, 2024 - The Subcommittee received a briefing from Todd S. Bridges, Professor of Practice, Resilient and Sustainable Systems, Associate Director for P3, Institute for Resilient Infrastructure Systems, University of Georgia.

October 10, 2024 - The Subcommittee received a briefing from Jon Phillips, Chief Executive Officer, Global Infrastructure Investor Association.

October 15, 2024 - The Subcommittee received briefings from the following:

- Jiqiu "JQ" Yuan, Ph.D., Chief Resilience Officer & Head of Engineering, National Institute of Building Sciences (NIBS)
- Aspasia "Sissy" Nikolaou, Ph.D., Earthquake Engineering Group Leader, Materials and Structural Systems Division, NIST

October 17, 2024 – The Subcommittee held an administrative discussion.

October 24, 2024 – The Subcommittee held an administrative discussion.

October 31, 2024 – The Subcommittee held an administrative discussion.

November 7, 2024 – The Subcommittee held an administrative discussion.

2.3. Organization of this Report

The remainder of this report is organized into the following four sections:

Findings – This section details the NIAC's seven major findings contributing to gaps in the U.S.'s approach to disaster response and resiliency.

Recommendations – This section lists the NIAC's eight recommendations to reimagine disaster response and resiliency.

Exemplary Practices – This section highlights innovative and strategic practices that emergency managers nationwide could consider and use to strengthen national preparedness, response, and resilience.

Call to Action – This section summarizes the impact/significance of the work done to complete the report and what the President's next steps may be.

3. Findings

3.1. As Disasters Have Increased, FEMA Has Been Tasked with Too Many Missions

Disasters are escalating in both scale and frequency, demanding stronger, more proactive responses than ever before. The number of $1 billion disasters has grown markedly.

From 1980 to 2023, there was an average of 8.5 yearly disaster events exceeding $1 billion [Consumer Price Index (CPI)-adjusted] as seen in **Figure 1**.[1] From 2019 to 2023, the average number of events yearly was 20.4. As of November 1, 2024, the National Oceanic and Atmosphere Administration (NOAA), the nation's scorekeeper of severe weather and climate events, recorded 24 disaster events exceeding $1 billion in damages.

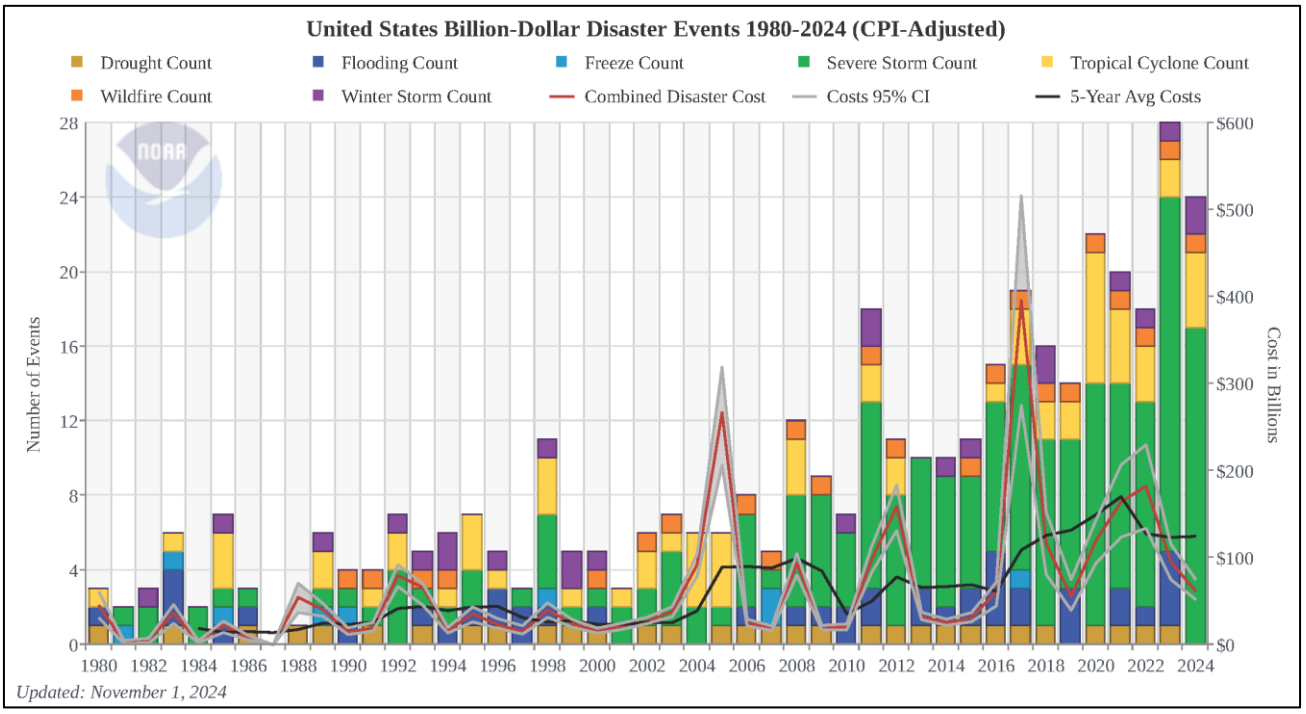

Figure 1. U.S. Billion-Dollar Disaster Events 1980-2024 (CPI-Adjusted)

FEMA, our nation's cornerstone in disaster response, faces an overwhelming challenge. As new disasters emerge on average every two weeks, older crises remain active, creating a mounting caseload that stretches FEMA's resources to its limits as depicted in **Figure 2**.[2]

In fact, as of November 8, 2024, FEMA has had 92 major declarations, 20 emergency declarations, and 58 Fire Management Assistance Grants (FMAG), averaging a FEMA-declaration or event every 1.8 days.

[1] NCEI.Monitoring.Info@noaa.gov. 2024. "Billion-Dollar Weather and Climate Disasters | National Centers for Environmental Information (NCEI)." Www.ncei.noaa.gov. July 9, 2024.

[2] This graph displays the volume of open disasters each week between 01/01/1953 and 12/31/2020. Each of the 4,498 disasters declared in this period is added to that volume on its declaration date and removed on its closure date.

Meanwhile, SLTT governments grapple with thousands of smaller disasters each year. The current situation demands a more resilient and robust national disaster response system, capable of scaling to meet the growing complexity and magnitude of disasters we now face.

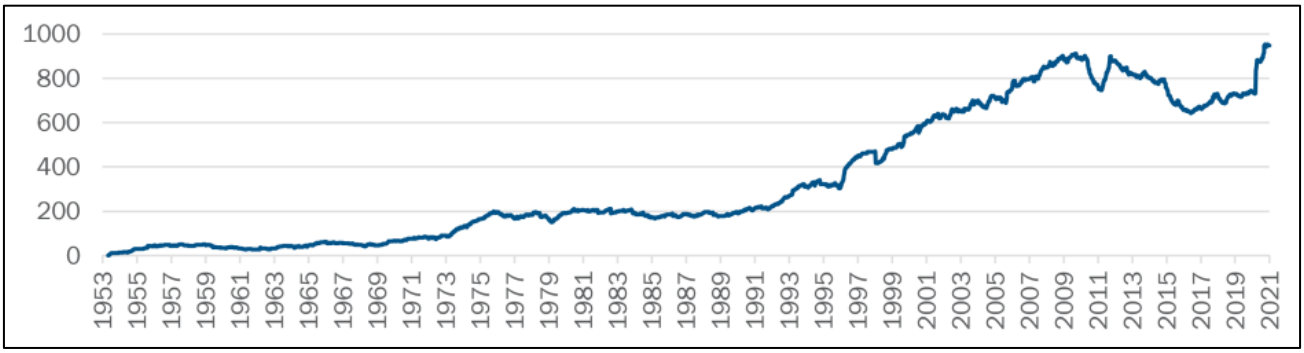

Figure 2. Number of Open Disaster Declarations per Week, 1953-2020

Since 2014, FEMA has been tasked with leading the response and recovery for numerous non-traditional events, including the sargassum crisis in the U.S. Virgin Islands (USVI); the Flint, Michigan and Jackson, Mississippi water crises; the saltwater intrusion into the Mississippi River in Louisiana; and the COVID-19 pandemic. At the same time, the number and severity of disasters has been increasing.

Not only are there more damaging disasters, but states and regions are now hit with multiple disasters back-to-back, impacting recovery timelines, as shown in **Figure 3**.[3] The U.S. environment, housing, and infrastructure are not designed for the frequency, severity, and repetitiveness of these disasters. And, since infrastructure systems are increasingly interdependent, failure of one component of an infrastructure can cause failure of that entire asset and cascading impacts to other infrastructure systems. For example, a loss of power may cause a loss of water services.

While the disaster response and recovery systems are reeling from multiple billion-dollar events, the risks of a national security emergency have been rising. If there is another, perhaps more widespread attack on the homeland, FEMA and its partners at Federal and SLTT levels may have to battle the consequences without the assistance of the DOD assets and staff, which accounted for some 50% of Federal government deployments for Hurricane Maria and other 2017 events. The disaster response system may need to be self-reliant and robust and act as a deterrent for attacks on the homeland.

The rising frequency and severity of disasters are fiscal alarm bells for the Federal government. The Office of Management and Budget estimated that the cost of just three of the many Federal relief and recovery programs would reach $2 trillion per year by the end of this century.

While FEMA's ability to step up in these instances is commendable, these multiple big disasters and new missions have created significant funding at FEMA and other funding agencies and critical workforce challenges.

[3] Aggregated recovery timelines for each state visited in the NAS information-gathering sessions, identifying specific disruptive events (circles) and recovery periods (colored bars) relative to pandemic surges (dark gray bars) during an ongoing pandemic period (light gray strip) and intermittent hurricane seasons (light yellow strip); National Academies of Sciences, Engineering, and Medicine. 2024. Compounding Disasters in Gulf Coast Communities 2020-2021: Impacts, Findings, and Lessons Learned. Washington, DC: The National Academies Press.

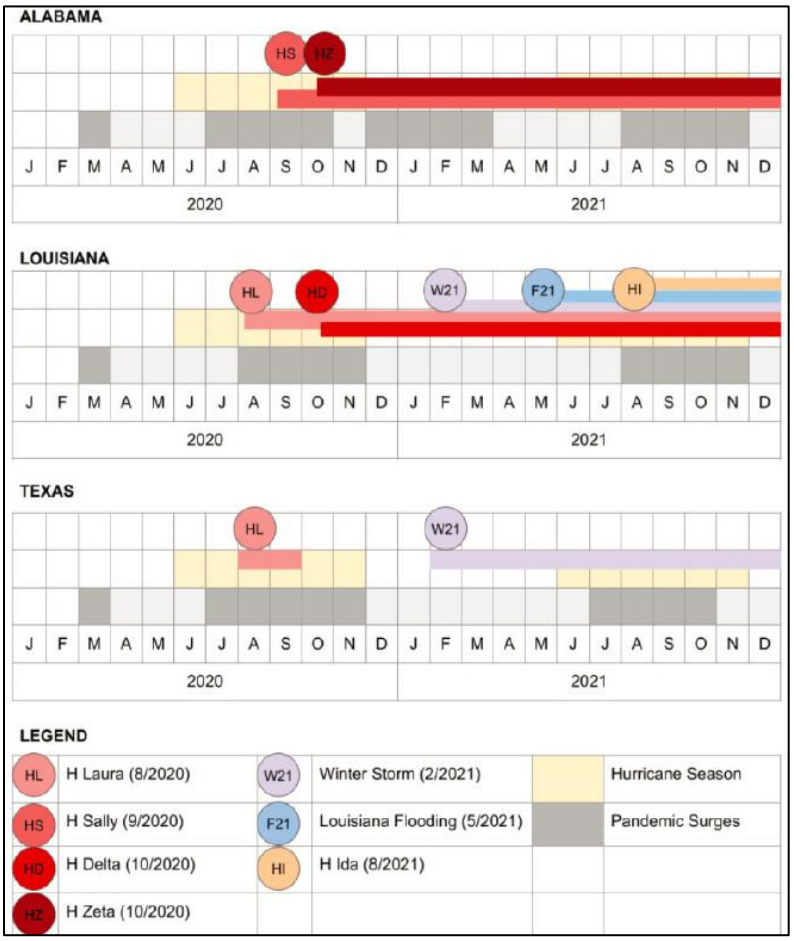

Figure 3. Aggregated Recovery Timelines for Compounding Disasters in the Gulf of Mexico Region: 2020-2021

3.2. Disaster Funding Process is Unsustainable

FEMA provides the majority of funding for response, recovery, and mitigation after disasters. FEMA uses the DRF to respond to disasters and to help communities recover. During the intense 2024 hurricane and wildfire seasons, the DRF faced critical funding shortages. At the height of hurricane season, with the DRF nearly depleted, FEMA instituted Immediate Needs Funding (INF), a financial mechanism to redirect remaining resources to immediate, life-saving needs. When the DRF drops below prescribed levels, INF conserves funds exclusively for new, critical life-saving actions, pausing ongoing recovery and hazard mitigation projects. This measure impacts not only ongoing PA projects but also crucial hazard mitigation projects that communities rely on to rebuild safely and sustainably.

Major disasters quickly drain the DRF. For example, within just 30 days of Hurricane Ian's landfall in 2022, FEMA spent nearly $2.6 billion—an average of $86 million per day—on critical response operations. Likewise, Hurricane Fiona in 2022 required nearly $1 billion in immediate funding within its first month. The back-to-back $1 billion disasters have been pushing the DRF into a precarious state multiple times during the year.

3.3. FEMA Has Critical Workforce Shortages

FEMA has long been the backbone of America's Federal disaster response capabilities. FEMA's disaster response force, designed to manage multiple incidents simultaneously, underscores the magnitude of its

staffing needs. In recent years, FEMA has grappled with significant workforce shortages that could impact the agency's ability to respond effectively to disasters and emergencies. These shortages have become increasingly apparent as event frequency and severity rise.

Permanent full-time employees form the backbone of FEMA, supporting the agency's mission and operations daily. Reservists work on an as-needed basis. They are appointed for up to two years that can be renewed and provide critical support during incident management operations. Cadre of On-Call Response and Recovery Employees (CORE) employees are a distinct category of temporary full-time staff dedicated to disaster response and recovery efforts. Other workforce categories include local hires, temporary staff, Senior Executive Service, and Schedule C employees. At the start of fiscal year 2022, CORE employees made up the largest segment of FEMA's team, as shown in **Figure 4**.[4] Following CORE members were reservists, permanent full-time and part-time employees, and a variety of other workforce roles as previously noted.

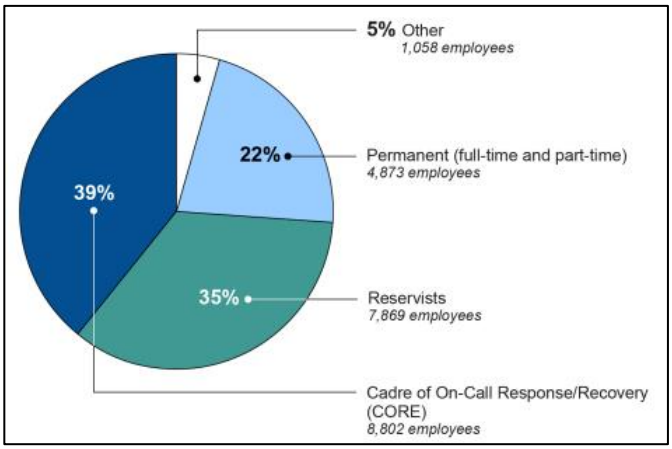

Figure 4. FEMA Workforce by Employee Type

Before the 2017 hurricane season, FEMA's force structure was built to handle two Level I, four Level II, and three Level III incidents, necessitating 16,305 personnel. However, during the 2017 and 2018 disaster seasons more than half of FEMA's cadres—specific operational or programmatic groups—struggled with staffing shortages. For example, during Hurricane Maria in 2017, 18 out of 23 cadres had only 25% or fewer staff members available for deployment.

In August 2017, FEMA's force strength stood at 10,683, only 86% of its target for that fiscal year with most of the cadres falling short of their target strengths as shown in **Figure 5**.[5] Between August 25 and November 30, 2017, FEMA deployed 73% of its force strength, illustrating the severe strain on resources during peak disaster periods. In mid-October 2017, 54% of FEMA staff deployed to these disasters did not hold the title of "qualified," according to the agency's qualifications system, meaning they had "no proficiency" or were a "trainee/candidate" in their deployed title. By November 2017, FEMA had deployed more than 17,000 individuals, including permanent FEMA workforce and additional augmentations. More than 13,000 DOD

[4] GAO, FEMA Disaster Workforce: Actions Needed to Improve Hiring Data and Address Staffing Gaps, GAO-23-105663, May 2023.
[5] FEMA 2017 Hurricane Season FEMA After-Action Report, July 12, 2018. FEMA cadre acronyms: ACQ- Acquisitions, ADR- Alternative Dispute Resolution, DEC- Disaster Emergency Communications, DF Disaster Field Training Officer, DI- Disability Integration, DSA- Disaster Survivor Assistance, EA- External Affairs, EHP- Environmental and Historic Preservation, ER- Equal Rights, FCO- Federal Coordinating Officer, FM- Financial Management, HM- Hazard Mitigation, HR- Human Resources, IA- Individual Assistance, IT- Information Technology, LOG-Logistics, NDRS- National Disaster Recovery System, OCC-Office of Chief Counsel, OPS Operations, PA- Public Assistance, PL-Planning, SAF- Safety, SEC- Security.

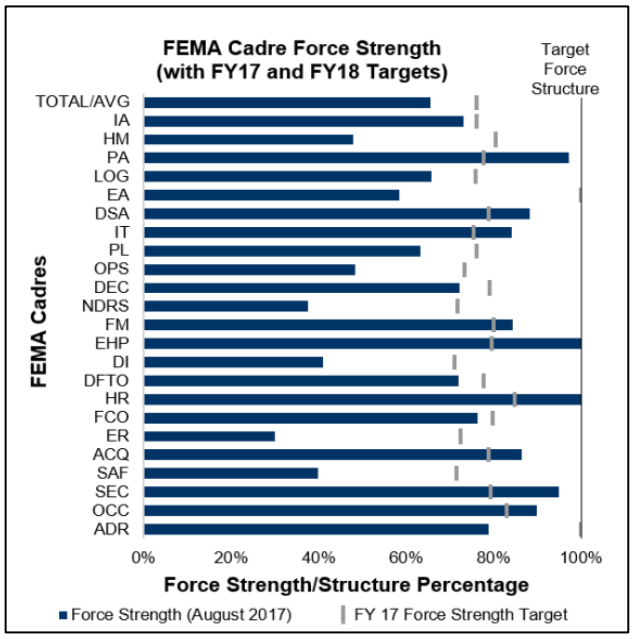

Figure 5. FEMA Cadre Force Strength Compared to the Cadre's Fiscal Year 2017/18 Targets

personnel were deployed to Puerto Rico and the USVI to help respond to and manage the crisis, illustrating the immense scale of Federal response required for major disasters.

These shortages and absence of fully qualified personnel persisted throughout the pandemic with round-the-clock deployments and National Response Coordination Center activation. Furthermore, the situation has not significantly improved in recent years. In October and early November 2024, during one of the most active hurricane seasons on record, FEMA's available incident management workforce strength ranged from 5% to 7% of its identified target based on the agency's Daily Operations Brief. This acute shortage reflects ongoing challenges in maintaining a robust and ready workforce.

The inability to retain a permanent workforce, to onboard reservists, and to prevent employee burnout limits FEMA's ability to deploy qualified, well-trained individuals to disaster sites in support of local jurisdictions. This can result in sending support staff into the field who do not fully understand the services and programs they are being sent to implement. The lack of understanding, on the part of deployed staff, of an overly complex response or recovery structure, particularly in specialized areas designed to assist individuals with access and functional needs, ultimately means impacted survivors may not be able to access the important resources needed to recover.

Mobilization Declinations

A major factor contributing to the outlined shortages was the high rate of mobilization declinations. Up to 48% of employees declined deployments due to the harsh and austere conditions in the field, particularly in remote areas like the USVI and Puerto Rico. Similarly, during the California wildfires in 2018, approximately 40% of personnel declined deployment. The unprecedented demand during the 2017 and 2018 disaster seasons seemingly led to significant burnout among FEMA personnel.

Recruitment Challenges

To address these issues and enhance recruitment flexibility, FEMA advocated for, and Congress passed the Civilian Reservist Emergency Workforce (CREW) Act of 2021. Signed into law on September 29, 2022, the CREW Act amends the Stafford Act and the Uniformed Services Employment and Reemployment Rights Act to provide critical protections for the civilian employment of FEMA Reservists during their deployment to disasters and emergencies, or while training for such deployments. Despite this change, recruitment has lagged far behind needs.

Training

FEMA Reservists, who comprise approximately 35% of FEMA's workforce, face barriers to accessing developmental opportunities when not deployed. These barriers include the lack of paid training time and

the necessary technology to participate in training. This then hampers their ability to develop essential skills and certifications and maintain or increase their qualification status.

Burnout and Double Tapping

FEMA struggles to maintain adequate reservist staffing levels due to an over-reliance on a limited pool of personnel. This over-reliance often results in what is known as "double or triple tapping," the same individuals are repeatedly called upon to serve in multiple capacities across different sectors—SLTT governments, the private sector, and the National Guard—creating a strain on their availability and effectiveness.

FEMA Reservists are allowed to hold state or Federal jobs, or positions in the private sector that interact with FEMA, provided they obtain written clearance from FEMA's Office of Chief Counsel and their supervisor. This flexibility aims to attract and retain a robust Reservist workforce by ensuring that their civilian careers are not jeopardized by their service commitments.

However, the issue of "double tapping" highlights the interconnectedness of disaster response efforts and the critical role that skilled personnel play in these operations. This leads not only to fatigue and burnout but also depletes the available talent pool. This constant cycling could diminish response teams' overall efficiency and resilience, as personnel are stretched thin across multiple commitments and responsibilities. This situation exacerbates the existing workforce shortages at FEMA, as fewer people are willing or able to commit to the rigorous demands of emergency management roles.

FEMA does call on other Federal agencies to provide personnel in times of disaster. During the 2017 hurricanes and wildfires, FEMA used its mission assignment authority to request staff from other agencies. FEMA deployed 2,740 personnel from eight U.S. Department of Homeland Security (DHS) components. FEMA also deployed 1,323 personnel from outside DHS, from 34 different agencies.[6]

3.4. Disaster Response Capacity Nationwide

The whole-of-nation disaster response system is in dire need of reform. In the American federalism framework, the Federal government and SLTT governments work together to manage disasters, supplemented by volunteer and non-profit agencies and the private sector. To interoperate, the rules of engagement must be simple and well-understood by all, including the 3,069 counties that are the first responders when disasters strike. The disaster response system must be streamlined—making it simple, scalable, and versatile enough to address disasters ranging from minor incidents to catastrophic events and executable by local governments.

3.4.1. Local emergency managers are not sufficiently trained to effectively use external resources.

Although all disasters are managed locally, many local jurisdictions need supplemental staff, resources, and capabilities. In the wake of major disasters, the ability of emergency management agencies to respond and recover effectively is vital. However, many agencies struggle with integrating and utilizing external resources like Incident Management Assistance Teams (IMAT), Urban Search and Rescue teams, and the Emergency Management Assistance Compact (EMAC). These specialized resources offer critical expertise and support

[6] Federal Emergency Management Agency, U.S. Department of Homeland Security. July 12, 2018 "2017 Hurricane Season FEMA After-Action Report."

that serve as a force multiplier for local and state resources. Yet, due to inadequate training, some local emergency personnel are unable to fully leverage these assets when they are requested and deployed. This leads to missed opportunities and overall diminished response effectiveness.

3.4.2. Inadequacies in threat and hazard identification and risk assessments lead to operational failures in disaster response.

Recent disasters, such as the Maui, Hawaii wildfires (2023), New York blizzards (2022), and Texas ice storms (2021), exposed critical gaps in the effectiveness of the Threat and Hazard Identification and Risk Assessment (THIRA) processes. In these events, emergency managers were caught off guard by the speed, magnitude, and complexity of the disasters. This highlights a fundamental issue – current THIRA protocols are not providing the necessary requirements for effective response. For example, FEMA's 2019 guidance[7] outlines standardized capability targets for disaster response, such as suppressing and extinguishing 300 structure fires within 24 hours of an incident. Yet, in Lahaina, over 3,000 structures were destroyed within just 15 hours, far exceeding the operational capabilities envisioned by THIRA.

Another example is that FEMA's current guidance[8] suggests that SLTT agencies set generic capability targets, such as delivering public warnings within a specific timeframe to a set number of people. Wildfire warnings may need to be issued within minutes, while hurricane warnings could have a lead time of hours or days. One of the best ways to understand the operational requirements is to use hazard-specific models. Without using such technology, planning will fall short and response to a disaster may not be effective.

FEMA's THIRA guidance, enshrined in the Comprehensive Preparedness Guide (CPG) 201, also fails to address the cascading and compounding effects of modern hazards. The absence of comprehensive guidance on the evolving nature of threats, such as increasingly intense hazards and cyber risks, leaves emergency managers unprepared for the realities of today's complex disaster landscape.

3.4.3. Most SLTT plans lack hazard-specific and capability-specific annexes.

Planning is a major cornerstone of capability building. While the vast majority of SLTT jurisdictions have Emergency Operations Plans (EOP) in place—99% of counties according to a 2019 National Association of Counties survey—there is a significant gap in preparedness. Most local jurisdictions do not have hazard-specific or capability-specific annexes. This shortfall may be attributed to limited resources but leaves communities vulnerable to the unique and complex challenges posed by the variety of disasters they may face (see section on EMPG funding).

FEMA's CPG 101, the foundational doctrine for emergency planning, mentions the importance of scenario-specific, hazard-based, and capabilities-based planning. However, it does not sufficiently emphasize the necessity of developing detailed hazard-specific annexes. As a result, many jurisdictions rely on general EOPs that outline broad response functions, often through the Emergency Support Functions (ESF), without addressing the operational demands posed by specific hazards.

This lack of hazard-specific annexes has serious consequences. An EOP typically does not account for the unique challenges of various disasters, such as effectively warning the public during a fast-moving event or which evacuation routes should be prioritized. Without these crucial details, response efforts may be

[7] Federal Emergency Management Agency, "2019 National Preparedness Report," 2019.
[8] Federal Emergency Management Agency, "National Preparedness Report," December 2023.

disorganized and ineffective, ultimately putting lives at risk – this is particularly true among populations at highest risk for negative outcomes associated with disasters, such as those with access challenges or financial issues. For example, during a hurricane, the absence of a capabilities-based annex may mean that response teams are unprepared for the scale of flooding, power outages, or infrastructure damage that can occur.

3.4.4. EMPG funding is critical for capability development but has not been adequate.

FEMA's EMPG is crucial for strengthening the nation's emergency management infrastructure. By providing financial support to state, local, and territorial governments, the purpose of EMPG is to enable these entities to develop and enhance their capabilities in preparedness, response, recovery, and mitigation. The funding supports vital activities such as training personnel, conducting exercises, and maintaining EOPs. This investment bolsters the overall readiness of communities to effectively manage disasters and fosters collaboration among various stakeholders, ensuring a coordinated response when emergencies arise.

EMPG funding has not kept pace with the escalating demands and responsibilities placed on local emergency management agencies, especially as disasters increase in frequency and intensity. While other Federal programs have seen significant funding boosts, EMPG allocations have remained comparatively stagnant, limiting communities' ability to build robust, responsive preparedness capabilities.

Consideration should also be given to providing EMPG funds to Federally recognized tribes. Although they are eligible for and often receive Federal funding for recovery, they receive no funding for preparation which would ultimately result in a reduction of impact from future disasters, reducing the overall cost of future disasters.

3.4.5. Critical gaps in exercises and after-action reviews undermine national preparedness.

Exercises can play a crucial role in building a resilient, high-performing capacity-building system. However, the current national infrastructure for these exercises is often under-resourced and poorly designed, limiting its ability to effectively identify gaps, spotlight critical areas needing support, and allocate resources to meet urgent needs. Without robust and reliable feedback from these exercises, the system cannot accurately pinpoint where improvements or new resources are needed, hindering our ability to build a truly prepared and adaptive nation. Strengthening this infrastructure is essential to drive meaningful, data-informed improvements that elevate readiness and resilience nationwide.

The lack of a cohesive exercise system is particularly problematic at the SLTT levels, the first line of defense against disasters. There is a high turnover in SLTT response staff, and many SLTT personnel have limited experience with disasters. Training and exercises are expected to fill this gap.

The whole-of-nation exercise system is fragmented. Although SLTT agencies perform exercises, the findings from such exercises are generally not shared with FEMA or any organization externally. FEMA helps SLTTs plan and conduct vital readiness exercises, but only when requested. In a typical year, FEMA is involved in coordinating 30 to 60 such exercises. FEMA also leads large-scale, national-level exercises, investing three to six months in preparation for each. These exercises test the nation's readiness against catastrophic scenarios. While these national exercises yield valuable insights, the reports remain largely internal, undergoing extensive review over several months before findings are finalized.

FEMA also has a separate program for exercising its own response and recovery operations. The reports from these exercises are also not shared, preventing SLTTs and other Federal agencies from learning and improving their practices.

Real events teach important lessons. The Post-Katrina Emergency Management Reform Act of 2006 (PKEMRA) mandates that FEMA evaluate disaster events to share lessons learned and implement best practices nationwide. Despite this clear directive, FEMA's track record on conducting After-Action Reviews (AAR) reveals a concerning shortfall. FEMA policy requires AARs for all Presidentially declared disasters. Yet, the agency has completed AARs for only 29% of such events between 2017 and early 2020, with 43% still in progress and 27% deferred, according to the U.S. Government Accountability Office (GAO).[9]

When completed, the AARs also tend to be narrowly focused on FEMA's actions, neglecting the critical roles of other Federal agencies, SLTT agencies, and private sector partners. Currently, there is no overarching authority or policy mandating interagency Federal AAR. This leaves a critical gap in the continuous improvement process essential for national disaster preparedness.

SLTT agencies face significant challenges in conducting AARs. Many jurisdictions simply lack the resources and expertise needed for effective AAR and implementing corrective actions. While larger states may have dedicated teams of five to seven staff focused on exercises and continuous improvement, smaller states often rely on just one person to manage exercises and track corrective actions. This disparity in capacity weakens a unified, resilient response to disasters, making it more likely for mistakes to be repeated and critical opportunities for improvement to be missed. Strengthening and streamlining AAR processes across all levels of government is urgently needed to ensure that every lesson learned leads to real, impactful improvements in disaster preparedness and response. Completed AARs by FEMA can be a valuable tool to inform the efforts of under-resourced emergency management agencies. Local jurisdictions can benefit from the best practices and lessons learned outlined in FEMA's AARs without having to financially invest in their creation.

3.4.6. There is a need to streamline the underlying doctrine for national disaster response.

The foundation of disaster preparedness is built on core components like the NIMS, ICS, THIRA, emergency planning, exercises, AARs, and corrective action. While these elements are essential, FEMA introduced a complex web of additional doctrinal constructs—31 in total, according to a RAND Corporation study—to support Federal agencies, SLTT partners, and the broader preparedness community.

Without a cohesive structure to unify their purpose or implementation this plethora of often competing doctrinal materials creates confusion and inconsistency for SLTT partners who rely on clear, actionable guidance to protect their communities effectively. As a result, disaster preparedness, response, and recovery efforts may become bogged down by procedural complexity and varying interpretations, hindering swift, coordinated actions during crises. There is an urgent need to streamline these doctrinal frameworks, ensuring they align seamlessly with on-the-ground needs, reduce ambiguity, and enhance the effectiveness of disaster preparedness and response across all levels of government.

[9] U.S. General Accountability Office, 2020. National Preparedness: Additional Actions Needed to Address Gaps in the Nation's Emergency Management Capabilities (GAO-20-297).

3.4.7. Private sector integration is fragmented, undermining disaster response.

Integrating the private sector into disaster response efforts remains deeply problematic, threatening the resilience of our nation's critical infrastructure during emergencies. With about 85% of critical infrastructure owned and operated by private entities, seamless collaboration between government agencies at all levels and the private sector is essential. Currently, this integration is insufficient and disjointed.

FEMA identifies some infrastructure as particularly important. These lifelines enable the continuous operation of government functions and essential services in communities. FEMA uses the lifelines construct to prioritize response efforts during disasters.

However, many of these lifelines or essential services are managed by private companies. Despite the existence of sector-specific coordinating councils under the DHS and various regulatory frameworks, significant gaps in collaboration persist. For instance, power companies participate in GridEx, a biennial exercise run by the North American Electric Reliability Corporation to prepare for grid-related emergencies. However, FEMA's involvement and integration, when appropriate, into these exercises has been minimal, missing critical opportunities to coordinate and strengthen national preparedness. Conversely, the Sector Coordinating Councils (SCC) and the Sector Risk Management Agencies (SRMA) do not participate in national or regional exercises, unless the scenario specifically involves a sector.

3.4.8. The disaster response system lacks sufficient capability and capacity for national security emergencies.

Infrastructure across the U.S. is facing multiple risks. Infrastructure is being damaged or destroyed in natural disasters, such as in western North Carolina after Hurricane Helene (2024). In addition, infrastructure is subject to cyber-attacks. Nowhere was the vulnerability of our infrastructure more evident than on May 7, 2021, when the Colonial Pipeline was hit with a ransomware attack and consequences cascaded through the Eastern Seaboard. The Attack on the Colonial Pipeline was reminiscent of an earlier 2020 attack that resulted in a pipeline shutdown and a 2018 attack that crippled pipeline company customer communication systems. A more recent example of vulnerabilities is the 2024 CrowdStrike outage. The NIAC's 2023 *Managing the Infrastructure Challenges of Increasing Electrification* report mentioned the rise in cyber threats as more digital infrastructure is deployed to effectively manage dispersed power operations. Many components of the infrastructure backbone are also vulnerable to electromagnetic pulse and geomagnetic disturbance.

Nation-states and other malignant actors may use multiple, coordinated attacks on lifelines to sap the will of the American people. These could escalate as a corollary to the physical and cyber-attacks on critical infrastructure. A multi-front, coordinated attack on the critical infrastructure of the U.S. would be a national security emergency, involving the whole of government, but with major implications for FEMA and the disaster response and consequence management system.

There is a dire need to ensure that we can adequately and swiftly respond to the consequences of enemy attacks on our critical infrastructure. As one of the briefers to the Reimagining Disaster Response and Resiliency Subcommittee mentioned, the readiness to respond is a deterrence to our enemies and must be a key component of the overall national strategy to protect the homeland.

If there is a coordinated foreign attack on America's critical lifelines, there are three major issues:

1. Civilian Federal agencies, including FEMA and SLTT partners, may have to respond and recover without the engagement of significant DOD resources. FEMA will be required to rely on the personnel "surge" approach, in which other Federal agencies provide staffing for response operations requirements.

   This is a simultaneity challenge – DOD forces are designed and resourced to meet national security requirements. This may well impact DOD's capacity to provide assistance for DSCA missions. As the 2017 AAR noted, DOD staffing constituted roughly 50% of total staffing at the peak of 2017 storm deployments by the Federal government. In addition, many of the FEMA reservists are also part of the DOD reserve force, further reducing FEMA personnel strength during response operations. Even without the impacts of DOD National Security requirements, the Federal response workforce is already blinking red. Some response cadres in the present hurricane season are below 10% availability versus desired levels. At a time of national crisis, FEMA's workforce issues may become an Achilles heel for the nation.[10]

2. During a state or criminally sponsored attack on our national security, FEMA, DHS, and critical infrastructure agencies charged with oversight of energy, water, telecommunications, fuel supply, etc. will need to coordinate effectively and swiftly to restore lifelines.

   National morale and the outcome of the war itself may depend on the speedy restoration of services, at least at minimum functionality, to maintain community functions in affected areas, as well as support the defense industrial base (including the use of the Defense Production Act as discussed in Congressional Research Service (CRS), October 2023). The implementation of the Defense Production Act may provide an approach to obtaining critical resources. This is especially true as there will likely be strained supply chains for many components of critical infrastructure. Restoration of the power grid (NIAC Electrification Report, 2024)[11] will be a major priority.

3. FEMA will likely have a prominent role in addressing the disinformation campaigns designed to negatively impact the morale of the American public. Such nefarious efforts by our enemies may well degrade response operations. FEMA's public affairs component will need to be at war footing under this coordinated attack scenario. Another important facet of this responsibility is the activation and use of the public warnings systems.

3.5. Disaster Recovery, Mitigation, and Resiliency

3.5.1. Escalating costs of disasters pose a growing threat to the Federal budget.

The rising frequency and intensity of disasters have far-reaching impacts beyond immediate hardship on individuals and communities—it places a growing strain on the Federal budget. With disaster-related costs surging, the number of events causing $1 billion in damages has steadily increased in recent years. Currently, the Federal government shoulders around 60% of these disasters, with the DRF alone covering roughly half of this Federal spending.[12] As disaster costs continue to rise, so does the impact on national finances. The Congressional Budget Office (CBO) projects that hurricane-related costs will escalate faster

[10] Lucie, Quinton. "How FEMA Could Lose America's Next Great War." Homeland Security Affairs 15, Article 1 (May 2019).
[11] "Addressing the Critical Shortage of Power Transformers to Ensure Reliability of the U.S. Grid." The President's National Infrastructure Advisory Council, June 2024.
[12] Congressional Budget Office, June 2016. Potential Increases in Hurricane Damage in the United States: Implications for the Federal Budget.

than the nation's Gross Domestic Product , underscoring the urgent need for proactive investment in resilience and mitigation.

OMB estimates that the Federal government could spend as much as an additional $25 billion to $128 billion annually for just six risks including coastal disasters, flood insurance, crop insurance, healthcare expenditures, and wildland fire suppression. Most of the increase is due to coastal disasters and flood insurance.

Locally, disasters have a deleterious effect on the economy. Especially, the rise in compounding disasters – where the same region faces repeated impacts within a short period – has significantly weakened some areas' ability to recover. Additionally, regional disasters can disrupt critical supply chains, such as oil and gas flow post-Katrina or the recent shortage of intravenous fluids after Hurricane Helene disrupted supply lines in western North Carolina. If Federal disaster recovery funding is reduced or withheld, the economic stability and long-term recovery of impacted regions could be at risk, making it more challenging for communities to rebuild and restore local economies.

3.5.2. The process of disaster recovery is not a complete system.

SLTT recovery panel discussions revealed a critical gap in recovery capacity. Effective capacity building requires a cohesive approach encompassing doctrine, guidelines, planning, training, exercises, AARs, and continuous improvement.

The National Disaster Recovery Framework (NDRF) was developed through a collaborative process with Federal interagency, SLTT partners, and non-governmental entities and provides the structure for coordinating recovery. The NDRF establishes six Recovery Support Functions (RSF), which are the key elements to assisting communities recover. Several jurisdictions have found the NDRF useful for structuring recovery, but many more jurisdictions do not have a plan. However, a unified community recovery vision is essential to avoid a fragmented recovery process. Federal funds often flow to several different SLTT agencies further complicating the recovery process, causing many elected leaders to establish new organizations to manage recovery efforts – such as the Louisiana Recovery Authority post-Katrina, the New York Governor's Office of Storm Recovery post-Sandy, and the Puerto Rico's Central Office for Recovery, Reconstruction and Resilience post-Maria. Successful recovery demands collaboration among all the agencies and organizations involved emergency management, housing, infrastructure, and budget agencies, as well as the public, the private sector, non-profits, and voluntary organizations. However, there is no standardized structure like the ICS to enforce coordination, and inter-agency rivalries often impede progress.

Despite the NDRF's recommended roles – Local Disaster Recovery Manager or State Disaster Recovery Manager – most SLTT governments still rely on roles like the Governor's Authorized Representative (GAR) and State Coordinating Officer (SCO), emphasized in 44 CFR § 206.41. Unlike NIMS and ICS, the NDRF lacks specific operational guidance for building a structured, cohesive recovery response, leaving SLTTs to navigate an inherently fragmented system.

There is currently no requirement for SLTT governments to develop recovery plans before or after a disaster, leaving most jurisdictions without preparation for large-scale recovery. One state shared its recovery plan template with all counties, but only 2 to 4% developed a plan. After a catastrophic event, SLTTs may be responsible for managing billions in Federal taxpayer recovery funds without prior planning or experience, forcing them to build complex, high-stakes recovery operations from scratch amid the

devastation. Federal recovery and mitigation programs are also perceived as high-risk, with stringent requirements. Non-compliance can lead to fund de-obligations — even at the project stages.

Training for recovery management is patchy at best. While some programs offer training on specific Federal programs, there is limited cross-training and virtually no comprehensive guidance or training on integrating PA and hazard mitigation funding. The Section 406 Mitigation funding[13] is often not used by grantees due to the lack of cross-training. Few PA practitioners fully understand the intricacies of FEMA's hazard mitigation program, leading to missed opportunities to strengthen resilience.

SLTT representatives also mentioned that FEMA's Program Delivery Managers, the primary liaisons for grantees, often lack familiarity with the range of Federal funding options and frequently experience high turnover. Without a robust training infrastructure, recovery expertise is limited, and the few skilled professionals are in high demand across all levels of government and the private sector. In one jurisdiction, efforts to double their recovery team stalled due to a lack of available PA or hazard mitigation experts.

Recovery exercises are also infrequently conducted and rarely emphasize creating a cohesive recovery vision or leveraging Federal programs to achieve lasting resilience. A unified, proactive approach to recovery planning and training is essential to building effective capacity.

3.5.3. Federal recovery and mitigation programs are challenging and slow, yet critical to communities.

The most profound impact of disasters is felt by the individuals, families, and communities affected by them. An intricate web of Federal programs is in place to aid recovery and support vital mitigation efforts that reduce risk and build resilience. However, navigating this "alphabet soup" of resources can be challenging, creating delays and roadblocks at a time when communities most urgently need support.

These programs include the FEMA PA and Individual Assistance (IA) programs, FMAG, Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC), Flood Mitigation Assistance (FMA), and other mitigation programs (e.g., Safeguarding Tomorrow through Ongoing Risk Mitigation (STORM) Act, Community Disaster Resilience Zones).

Beyond FEMA's programs, there are more programs, including: HUD's CDBG for both Disaster Recovery and Mitigation; SBA programs; the Federal Transit Administration's Public Transportation Emergency Relief Program; and recovery and/or mitigation programs from U.S. Army Corps of Engineers (USACE), U.S. Department of Agriculture (USDA), NOAA, the Environmental Protection Agency , DOE, and DOI, etc.

Funding, from various Federal agencies, carries differing and often conflicting requirements, including eligibility, cost-shares, environmental review, and wage and labor requirements. SLTT entities are expected to braid these various recovery programs to meet their own vision of recovery, oftentimes with limited or no experience in long-term recoveries.

The Reimagining Disaster Response and Resiliency Subcommittee heard from a panel of SLTT emergency managers with hands-on experience in disaster recovery and mitigation programs. They identified a long list of issues with the multitude of Federal recovery and mitigation programs, including:

[13] FEMA's Public Assistance Section 406 Mitigation allows discretionary funding for mitigation measures completed in conjunction with repairing disaster-damaged facilities.

- Programs are too complex, discouraging many jurisdictions from even applying for them. This is especially the case with mitigation and resiliency programs.
- Recovery and mitigation projects take too long (sometimes 10 to 15 years or more).
- Costs rise over the course of a project, sometimes 20 times or more over the lifespan.
- Federal programs over-emphasize compliance rather than speed of recovery or resiliency objectives.

Simplifying and accelerating these Federal efforts is essential to ensuring that communities not only recover but are also equipped to withstand future threats.

3.5.4. FEMA's PA Program is complex, slow, and missing the mark on resilience.

FEMA's PA program is the largest Federal disaster recovery program in terms of funding.

Figure 6[14] reveals that nearly half of all DRF spending from 2000 to 2013 went toward PA alone.[15] This allocation underscores PA's central role in recovery. The Federal government covers 75% of recovery costs, with contributions rising to 90% in the most severe cases, reflecting its vital role in supporting communities after disaster strikes.

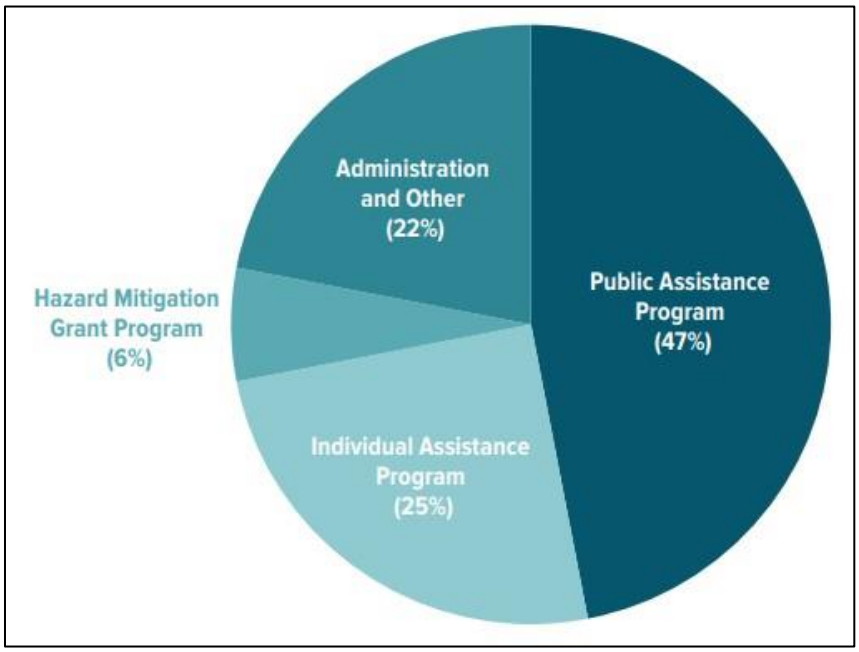

Figure 6. Share of Spending from FEMA's DRF, by Type of Activity, Fiscal Years 2000 to 2013

SLTT Recovery panel members mentioned two specific concerns about the PA program – technology issues and financial reporting.

On the technology front, FEMA's Grants Portal is a shared resource between FEMA and grantees. However, grantees noted that it is cumbersome, and Federal quarterly financial reporting on PA implementation is onerous. A moderate or large disaster may have hundreds or even thousands of PA projects approved, resulting in complicated financial data aggregation for reporting. Most grantees (mostly states) are expected

[14] Source Congressional Budget Office (CBO), 2016, p. 43.
[15] Using pandemic figures would artificially inflate PA as significant portions of Federal COVID-19 funding to SLTTs is under the PA program.

to do sophisticated financial accounting for hundreds of accounts (Project Worksheets) without the support of appropriate accounting software customized for disaster recovery.

FEMA representatives acknowledged the need to simplify the PA program, listing this as an objective in the FEMA 2022-2026 Strategic Plan. The Agency also re-established the PA Steering Committee and reviewed the PA National Delivery Model in 2023.[16] The assessment echoed many of the concerns expressed by the Subcommittee's SLTT recovery panel.

Speed of delivery was a core issue raised by the SLTT recovery panel. FEMA's 2023 analysis of the National Delivery Model indicated that it took on average 267 days to obligate PA project funds (non-COVID-19) – 116 days longer after a revised process meant to reduce the time was put into place. Additional reports highlight that many PA projects face significant delays due to various factors within the project lifecycle. While environmental and historic preservation reviews are generally expected to be completed in about 30 days, some PA mitigation projects have experienced staggering delays – taking as long as 693 days in 2018. Obligation of funds is just the start of the recovery process – the actual implementation of the projects and closeout takes years and sometimes decades. As was noted in Subcommittee discussions, the recovery from 9/11 using PA funds was finally closed out 16 years later in 2017, and recovery from Hurricane Katrina is still ongoing after 19 years. These prolonged timelines hinder recovery efforts and strain resources at the SLTT levels, emphasizing the urgent need for streamlined processes.

The Reimagining Disaster Response and Resiliency Subcommittee's SLTT recovery panel noted a troubling trend within the PA program – an overwhelming emphasis on compliance at the expense of timeliness and effective recovery and resiliency outcomes. This focus was underscored in the 2023 review of the PA program, which identified a culture of fear within FEMA, driven by anxieties over making mistakes and potential fraud, waste, and abuse. The concerns extend beyond FEMA, with oversight agencies such as GAO, the DHS Office of the Inspector General (OIG), and the CRS consistently critiquing the Agency for decisions that lead to perceived overpayments or erroneous disbursements. This environment stifles innovation and agility in recovery efforts, ultimately jeopardizing the support communities desperately need in times of crisis.

The 2023 review notes that FEMA's risk management method involves excessive documentation and multiple reviews to ensure that costs are eligible and reasonable and that there is no fraud, waste, or abuse. This approach, at times, counters the mission of recovery, lengthens timelines and increases costs. As timelines extend, costs continue to escalate, requiring re-review and revision of project worksheets, adding to a recovery's complexity.

Although risk management principles would suggest that some level of error should be tolerated, FEMA and its oversight agencies continue to try to prevent any error. The 2023 review notes two examples of this: a perception that it is unacceptable for costs to be misstated by even $0.25, and an audit of 47 projects totaling over $84 million with a finding that spending just over $1,500 (0.00196% of total costs) was improper.

After Hurricane Sandy, efforts to simplify the PA program, namely, the PA Alternative Procedures (PAAP) program showed promise. A DHS OIG assessment[17] indicated that grantees using PAAP found it beneficial,

[16] CNA Corporation, January 2023. Review of FEMA Public Assistance National Delivery Model.
[17] Office of Inspector General, DHS. February 4, 2022. FEMA Should Apply Lessons Learned from the STEP Pilot Program Implementation in Puerto Rico to Future Programs.

as it reduced administrative burdens and may have resulted in overall cost savings. This delivery model was most recently applied in Puerto Rico following Hurricane Maria. Unfortunately, the old cycle of submit-review crept back in, as shown in **Figure 7**.[18]

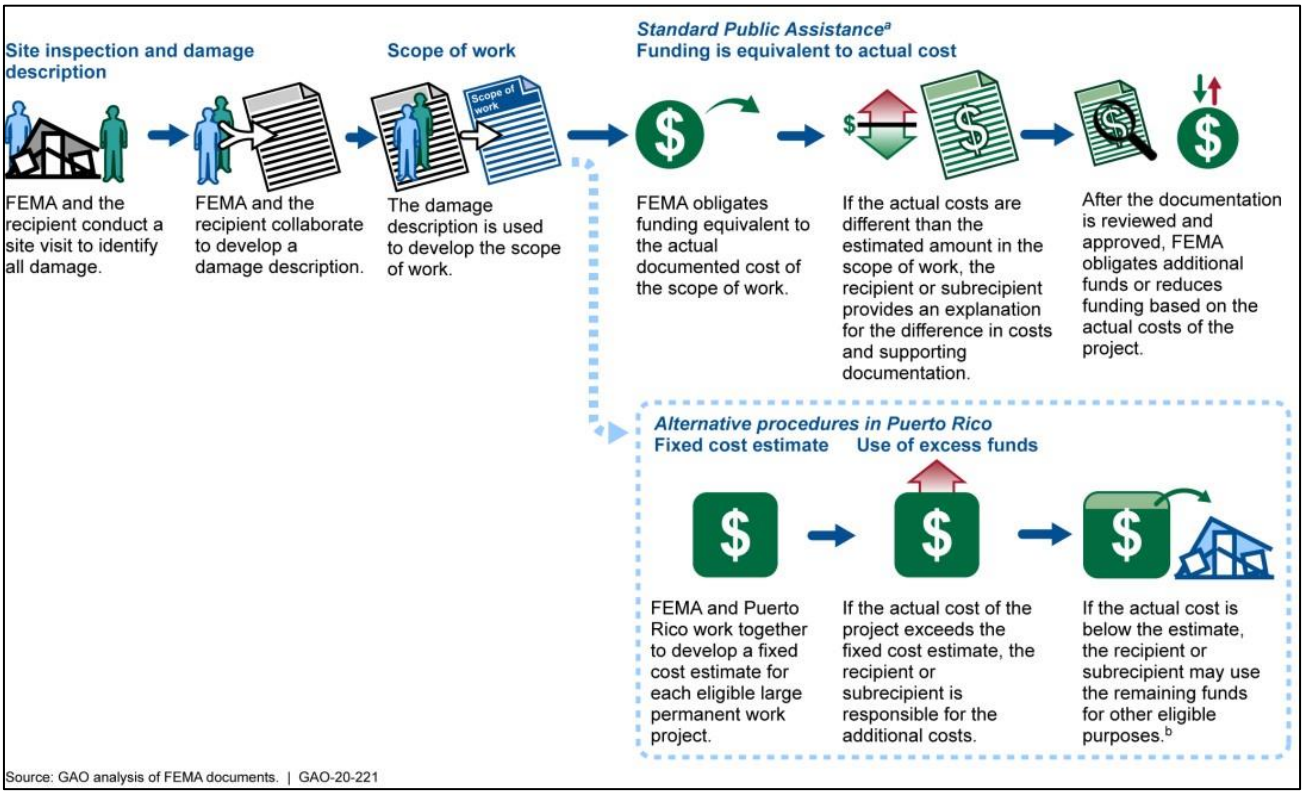

Figure 7. Share of Spending from FEMA's DRF, by Type of Activity, Fiscal Years 2000 to 2013

3.5.5. Federal mitigation and resiliency is complex and fragmented.

Both OMB and CBO estimate that disaster costs will continue to increase. More than half (55%) is due to increasing development in coastal areas.[19] NOAA estimates that 40% of Americans live on the coast,[20] and the numbers are increasing, exposing more people, homes, and infrastructure to disaster damages. The urgency of the situation is evident, with extreme weather events already inflicting over $1 trillion in damages across the U.S. between 2016 and 2022, as reported by the President's Council of Advisors on Science and Technology.

Moreover, much of the U.S. infrastructure is aging, with many systems between 50 and 100 years old. As the U.S. faces the necessity of updating and upgrading this infrastructure, it is fiscally prudent to embed resilience into systems, ensuring they are equipped to withstand the challenges of the 21st century and beyond.

Investing in Federal mitigation and resilience is an essential strategy for safeguarding the U.S. economy, communities, and their lifelines.

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[18] GAO, Puerto Rico Disaster Recovery: FEMA Actions Needed to Strengthen Project Cost Estimation and Awareness of Program Guidance, GAO-20-221, p. 12.

[19] Congressional Budget Office, June 2016. Potential Increases in Hurricane Damage in the United States: Implications for the Federal Budget.

[20] National Oceanic and Atmospheric Administration, 2021. Economics and Demographics.

Federal Mitigation Programs: Increasing Funds and Their Impact

Assessments of mitigation programs find that for every $1 invested, the savings in reduced future losses is an average of $6 (NIBS, 2019). These studies and the rising levels of disaster damage have resulted in successive administrations and Congress allocating more funding for disaster mitigation and resiliency. However, between 2004 and 2013, mitigation only accounted for 5% of the total DRF spending as depicted in **Figure 8**.[21]

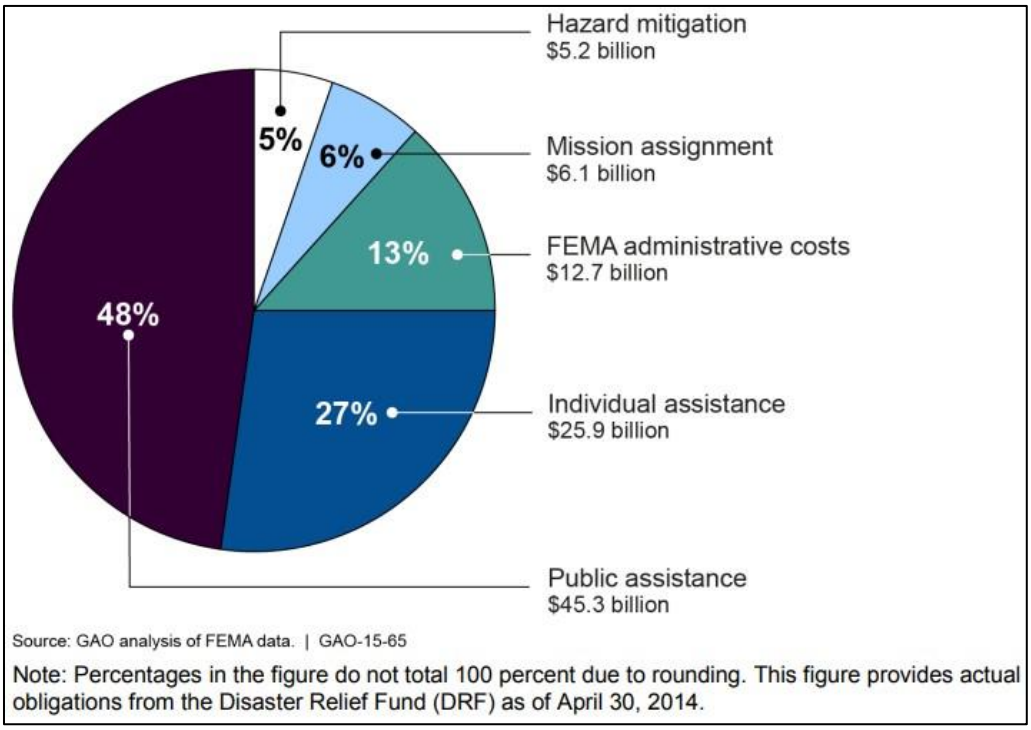

Figure 8. Total DRF Obligations for 650 Major Disasters Declared during Fiscal Years 2004 through 2013 by FEMA Cost Category

Federal mitigation programs have gained significant momentum, demonstrating strong promise and support for SLTT initiatives. This growing emphasis not only underscores the importance of resilience in our communities but also amplifies our collective capacity to effectively prepare for and respond to future challenges.

The Disaster Recovery Reform Act of 2018 established the BRIC program in fiscal year 2020. BRIC increases the pool of funds for mitigation – capped at 6% of the total estimated disaster expenses for the prior years' disasters. In addition, the Infrastructure Investment and Jobs Act (IIJA) appropriated $1 billion for BRIC and $3.5 billion for the Flood Management Assistance program.

FEMA also created the Swift Current Initiative Funding Opportunity, a program to provide quick funding for repetitive loss properties insured under the NFIP and damaged by a disaster. The STORM Act of 2020 created a State Hazard Mitigation Revolving Loan Program, with $500 million available over multiple years, that allows states to take the initiative for hazard mitigation projects. It requires a 10% match, and interest

[21] GAO, Federal Emergency Management Agency: Opportunities Exist to Strengthen Oversight of Administrative Costs for Major Disasters, GAO-15065, p. 13.

rate cannot exceed 1%. Additional mitigation funding is available under the CDBG-MIT program and FEMA's Community Disaster Resiliency Zones (CDRZ).

Hazard mitigation programs suffer from some of the same issues as the PA program – they are complex, policies change too often, the need for extensive documentation is daunting, and the review cycles are too long.

The Reimagining Disaster Response and Resiliency Subcommittee's SLTT recovery panel noted several concerns with mitigation and resiliency programs/guidelines:

- Challenges and barriers associated with mitigation programs prevent many states, cities, counties, tribes, and territories from applying for mitigation funding.
- The variety of Federal programs with separate requirements is confusing. There is difficulty in layering the multitude of mitigation and resiliency funds to achieve their objectives.
- The SLTT cost share for hazard mitigation programs is generally 25%, an immediate barrier for many communities.
- FEMA's funding timelines often do not align with state budget timelines, making the match requirements even more problematic.
- Mitigation programs require a benefit-cost analysis (BCA) to justify fund expenditures. Most grantees find this complex and onerous. Some panel members mentioned that it is hard to estimate benefits and costs over prolonged periods (e.g., 40 years).
- The current FEMA BCA tool is hard to apply for some types of projects, such as nature-based solutions.
- SLTT entities have limited capacity and expertise and, thus, need more technical assistance from FEMA and other stakeholders in developing and implementing mitigation projects.
- There is confusion about CDRZ, including the fact that BRIC programs are not available in CDRZs.
- Newly issued Resiliency Guidelines are too high-level and not operational, and it is unclear how they fit with FEMA and HUD mitigation programs. Many jurisdictions also struggle with the roles of emergency managers versus Chief Resiliency Officers in resiliency initiatives.

GAO's 2021 review of mitigation programs (GAO, February 2021) [22] shows that the same problems existed then. State and local officials told GAO that 19 to 24 months could elapse between hazard mitigation grant applications and grant awards. In the meantime, if the project involved the acquisition of homes in flood-prone areas, homeowners rebuilt or changed their minds and were no longer interested. It was also harder to get state budgets lined up to provide the cost share because SLTT emergency managers could not forecast when awards would be issued.

BCAs for mitigation programs pose significant challenges for many SLTT governments. Conducting a BCA requires extensive data collected over years even decades, encompassing project costs, design engineering, and various benefits. Unfortunately, the current BCA tool inadequately captures economic losses like lost revenue or environmental gains. Recent research by NIST and FEMA (see section on Functional Recovery) highlights that these losses, along with benefits such as reduced operations and maintenance costs, often outweigh actual project costs.

[22] U. S. Government Accountability Office. 2021. "Disaster Resilience: FEMA Should Take Additional Steps to Streamline Hazard Mitigation Grants and Assess Program Effects." Www.gao.gov. February 2021.

While FEMA has made efforts to streamline the BCA process—updating tools and providing default values for common mitigation measures—many jurisdictions still hesitate to apply for funding. These trends suggest that more affluent communities with dedicated hazard mitigation staff and access to consultants (see Survivor Services, Preparedness, and Roles section) are the primary beneficiaries of available funding, leaving less affluent areas at a disadvantage.

3.5.6. HUD's CDBG-DR Program is Essential for recovery and mitigation but hindered by funding delays.

Since Hurricane Andrew in 1992, and particularly since Hurricane Katrina in 2005, Congress routinely allocates substantial supplemental appropriations to HUD for its CDBG-DR program. This funding primarily addresses unmet needs in low- and moderate-income areas, supporting housing, infrastructure, and economic recovery.

From 1992 to 2021, HUD has awarded over $89.8 billion in CDBG-DR funds through at least 38 Congressional supplemental appropriations. In comparison, FEMA received $381 billion for the DRF during the same period, with nearly three-quarters sourced from supplemental appropriations. Notably, CDBG programs account for 30% of the total recovery and mitigation funding from FEMA disaster recovery programs. A significant milestone occurred in 2018 when a Congressional supplemental provided $12 billion for mitigation funding, leading to the establishment of the CDBG-MIT program, which allocated $16 billion for mitigation activities from 2018 to 2022.

However, CDBG allocations require Congressional approval, often resulting in delays that hinder recovery and mitigation activities. Additionally, CDBG funds can serve as a cost-share match for FEMA's recovery programs, but uncertainty about funding amounts complicates communities' ability to create a comprehensive recovery and resiliency strategy after major disasters. Smaller disasters may not receive any CDBG funds, limiting their capacity to meet cost-share requirements for FEMA's recovery programs that require a 10 to 25% cost share.

3.5.7. Housing is the most basic infrastructure and is fraught with problems.

Housing is infrastructure. If a disaster survivor does not have a roof over their head, other infrastructure concerns such as power or water are of lower consequence. However, housing is problematic even before a disaster strikes a community. There is a housing shortage in the U.S. – the Nation is missing, by some estimates, four to seven million homes.[23] Furthermore, accessible housing is in particularly limited supply.

Many low-income families occupy homes that would not be considered decent, safe, and sanitary, even before they are damaged by disaster. Many more homes are not code-compliant, especially as the building codes are upgraded every three to five years, but existing homes only upgrade to code if there are substantial renovations, either before or after a disaster. Thankfully disasters only strike a fraction of the nation's housing stock, but that also means that the housing stock is not changing drastically. While home construction may not be to existing code, the risk survivors face is growing as areas outside the mapped flood risk area are flooding, and wildfires sweep into more and more of the urban-wildland interface.

[23] National Low Income Housing Coalition, 2024. "NLIHC and Pew Charitable Trusts Release Brief Showing Widespread Support for State and Local Policies to Allow More Housing."

Housing problems start early in the disaster response phase and remain challenging for years after major disasters. The Reimagining Disaster Response and Resiliency Subcommittee heard about the challenges of housing recovery from briefers discussing the Maui wildfires, Puerto Rico recovery, and from the SLTT recovery panel. GAO has cited temporary housing after disasters and long-term housing recovery both as pernicious problems that occur disaster after disaster.

When disasters damage or destroy homes, an immediate response objective is to provide temporary housing. Temporary housing has been problematic for decades, experienced by many communities. Despite the vaunted mobility of Americans, most survivors are rooted in their communities. Solutions must be found to house them close to jobs, schools, houses of worship, etc. Prior to 2005, mobile homes were a stop-gap solution. After Hurricane Katrina, thousands of mobile homes were requisitioned as temporary shelters, unfortunately there was a problem with formaldehyde poisoning. After Hurricane Sandy struck densely populated New Yok City, it was clear that there was no space to place mobile homes on people's properties or even in mobile home parks (permanent or temporary). FEMA's Shelter and Temporary Essential Power (STEP) program was born out of necessity. It effectively allowed owners and tenants to stay in the homes they occupied prior to the hurricane, with minor repairs. This program was eventually used to allow hundreds of thousands of survivors to stay in damaged structures for the major storms in 2017 including Irma, Harvey, and Maria. FEMA cancelled the STEP program citing high costs ($1.4 billion for Puerto Rico) and extended timelines (16 months versus the expected six months) (OIG, 2022).[24] Temporary housing remains problematic for recent disasters, with prime examples including areas affected by the Maui wildfires in 2023 and Hurricane Helene in 2024.

The biggest problem with temporary housing is finding an appropriate group site to place the mobile homes. Once a site(s) is found, it takes months to get permits, install foundations, connect utilities, and ensure mobile homes are functional. Sometimes there are supply issues (the demand for mobile homes/travel trailers after major disasters often exceeds supply). Sometimes there are physical constraints, such as no place to put mobile homes or trailers in urban New York City after Hurricane Sandy. Federal regulations also play a part, as mobile homes cannot be placed in a floodplain. These and other issues cause months and sometimes a year or longer of delay before survivors can move into temporary housing.

Meanwhile, FEMA's Temporary Sheltering Assistance is limited to 18 months – a timeframe that is often not sufficient to find alternate housing. Long-term housing recovery programs funded by HUD face even greater problems, as Congress must first appropriate funds, and then HUD administrative requirements must be met before long term housing programs are initiated. While the homes are repaired or rebuilt, families are in temporary housing. This process may take several years.

A family affected by one major disaster takes about ten years to recover, especially since many low-income households live in some of the most vulnerable homes. If in that time, they are hit by another major disaster, the chances are they would not recover. [25]

[24] Office of Inspector General, DHS. February 4, 2022. FEMA Should Apply Lessons Learned from the STEP Pilot Program Implementation in Puerto Rico to Future Programs.

[25] National Academies of Sciences, Engineering, and Medicine. 2024. Compounding Disasters in Gulf Coast Communities 2020-2021: Impacts, Findings, and Lessons Learned. Washington, DC: The National Academies Press.

3.5.8. Current building codes and standards for housing are for life safety, not resiliency.

Current codes and standards for the built environment are meant to only protect occupant life, but do not specifically incorporate resiliency. Therefore, structures may protect lives during a disaster but could require costly repairs or rebuilds. Often, Federal disaster programs only require that heavily damaged structures be built to the existing code. Federal disaster recovery programs such as HUD CDBG require that survivors can return to decent, safe, and sanitary housing. Achieving "life-safe" buildings is a major accomplishment of 20th-century research and code development. But the goal should be to build more resilient, 21st century infrastructure, aligning with public expectations."

There are examples of HUD CDBG grantees going beyond decent, safe, and sanitary housing to upgrading the housing stock for survivors. For disasters before Hurricane Harvey, the State of Texas General Land Office adopted a policy that if one shingle of a roof on a home was damaged, the entire home would be reconstructed to code. Another CDBG-DR-funded program provided a resiliency upgrade for homes that had damage consonant with high velocity winds. More than 2,000 homes were provided additional funds to upgrade to the National Home Builders Association Resilient Home Construction Standard, which includes hurricane straps, stronger windows, garage doors, etc. After a subsequent hurricane impacted the same areas, the state conducted an assessment, and the value of resiliency was evident. Almost all the homes that had completed repairs sustained no damages, and much of the remainder had minimal damages. However, it is important to note that using higher recovery standards takes longer, as more recovery work is needed and some materials (e.g., higher quality windows) take longer to procure. It also costs more per home – an average of 25% more.

FEMA estimates that if only 70% of new buildings follow the International Code Council's (ICC) I-Codes, the total damages averted would be $132 billion.[26] Only 20% of the current housing stock is ICC I-Code compliant. If all homes (existing and new) are ICC I-Code compliant, the savings in avoided damages would be five times greater. Building codes provide $11 savings for every $1 invested,[27] but 65% of U.S. counties, cities, and towns had not adopted modern building codes as of 2020.[28]

There are several resilient housing standards that go beyond the basic building codes. These include Resilient Home Construction Standard, FORTIFIED, Build Strong, etc. According to the IBHS, building to FORTIFIED standards will save from one-third to two-thirds of housing losses during disasters. FORTIFIED standards for multi-family housing may add between 0.3% and 1.4% for new construction but the rate of return is between 8% and 72%.[29]

Since there are many competing building code regimes, Federal agencies have been reluctant to require use of a specific one. Also, some codes are not relevant for areas where construction norms are different from the rest of the country (e.g., construction practices in USVI or Puerto Rico). Nevertheless, it is imperative that Federal agencies provide guidance on resilient building codes that are protective of the nation's investment in homes and buildings repaired or reconstructed after a disaster.

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[26] Federal Emergency Management Agency, U.S. Department of Homeland Security. Building Codes Save: A Nationwide Study: Losses Avoided as a Result of Adopting Hazard-Resistant Building Codes, November 2020.
[27] National Institute of Building Sciences, Multi-hazard Mitigation Council, 2019. Natural Hazard Mitigation Saves.
[28] Federal Emergency Management Agency. 2020. "PROTECTING COMMUNITIES and SAVING MONEY the Case for Adopting Building Codes."
[29] Alabama Center for Insurance Information and Research, "ACIIR: Resilient Construction Offers Strong Return on Investment – the Culverhouse College of Business | the University of Alabama," University of Alabama, October 13, 2022.

3.5.9. Home buyout programs struggle to address properties that experience repetitive loss.

There are a number of properties across the nation that have flooded more than once. A review of claims data between 1973 and 2021 indicated that the NFIP may have paid 737,000 claims for 290,000 properties, totaling about $40 billion (net present value) (although some data quality issues persist with this estimate).[30] The NFIP defines the terms repetitive loss and severe repetitive loss properties, and it has a set of policies to prevent repeatedly paying out claims.

One of the most effective of these is to buy out the properties that are consistently in harm's way. Various Federal agencies allow the acquisition or buyout of flood-prone properties to reduce risks, including FEMA, HUD, USACE, and USDA. FEMA is the largest funder of buyout programs and has spent about $4 billion since 1989 to acquire more than 45,000 homes.[31]

Most FEMA buyouts occurred in areas where 85% of residents were white and non-Hispanic, as compared to the 62% of white and non-Hispanic in the U.S. population.[32] The average time to complete buyout from the time of the disaster to project closeout was 5.7 years (from 0.4 years to 16.8 years). Many buyout programs suffer from "checkerboarding" – a random pattern of some homes being bought while other homeowners are not ready to sell, reducing the overall benefits of a buyout program. Finally, applying for a buyout program is complicated.

FEMA has taken steps to empower vulnerable communities, helping those with limited technical expertise navigate BCA procedures to effectively conduct buyout programs. In 2013, FEMA provided applicants with pre-calculated benefits for the BCA if buyouts are desired for homes in the Special Flood Hazard Area (SFHA). Applicants can put in a simplified application if the costs were at or below $276,000, which increased in 2021. FEMA also recognizes that there are repetitive loss and severe repetitive loss properties outside of the SFHA that should be acquired. FEMA conducted an analysis and informed potential applicants that if the cost of acquisition for a property is up to $323,000, it would be beneficial to acquire.

HUD CDBG programs also allow risk reduction, with one major difference. HUD buyout, like FEMA's, requires that acquired properties be demolished and the land be left open in perpetuity. But HUD also allows "acquisition" of properties, where land can be used for other purposes after homes are demolished.

But buyout and acquisition programs are politically sensitive, complex, and expensive – most SLTT governments do them reluctantly, if at all.

3.5.10. Infrastructure codes and standards in use today do not deliver resiliency.

For buildings, various building codes codify what needs to be done for life safety and even resiliency. For infrastructure systems (other than buildings), such as water systems, electric power, and transportation, the picture is not as clear. Infrastructure codes are defined by different entities, using different criteria. **Figure 9**[33] shows how each infrastructure's codes are designed for different design hazards (100-year and 500-year

[30] Federal Emergency Management Agency, U.S. Department of Homeland Security. Methodology Report: Acquisition Benefit-Cost Analysis (BCA) Efficiencies for HMA Programs, February 2022.
[31] U.S. Government Accountability Office. 2022. "FLOOD MITIGATION Actions Needed to Improve Use of FEMA Property Acquisitions Report to Congressional Requesters United States Government Accountability Office."
[32] Mach, K.J et al. "Managed retreat through voluntary buyouts of flood-prone properties." Science Advances vol 5, no. 10 (2019):1-9.
[33] NIST. "Technical Note 2209 Assessment of Resilience in Codes, Standards, Regulations, and Best Practices for Buildings and Infrastructure Systems. P. 6-7.

flood for buildings). Therefore, the same event (e.g., earthquake of a specific magnitude) can cause various parts of the infrastructure to have different amounts of damage.

	Commonality of Design Hazards (Baseline Event MRI, yr)*			Recovery Performance Provisions (Risk Category IV or Highest)		
Sector	Flood	Wind**	Seismic	Function Loss	Recovery Time	Damage Cost***
Buildings (ASCE 7)	100/500	100/1700	500/2475	Continued operation	Days to weeks	<10%
Water	500	ASCE 7	ASCE 7	Continue operation	Days to weeks (per AWWA J100)	No criteria
Electric Power	100/500	ASCE 7	ASCE 7	Emergency backup	No criteria, relies upon operational guidance docs	No criteria
Transportation**	<100/100	ASCE 7	1000/2500	Continued operation, no collapse	Days to weeks	No criteria

*Routine / Design event levels. ASCE 7 alignment is shaded green
**Additional MRI used are based on design categories, code versions, and between modes
*** Percent of facility/system replacement cost

Figure 9. Key Resilience Provision Comparison of Codes and Standards by Sector and Hazard

The infrastructure codes by and large do not account for changing environmental conditions. Current infrastructure codes target performance of components within an infrastructure system (e.g., piping, tanks, pumping stations), not whole systems. The current codes do not consider the interdependency of multiple infrastructure systems, and therefore do not address cascading impacts.

The current minimum codes and standards for infrastructure will not result in a resilient community.[34] Without a common definition of what resilient infrastructure is, disaster recovery and mitigation efforts are left to define it ad-hoc for various disasters and programs.

3.5.11. The U.S. does not have a cohesive resiliency strategy.

The increasing number of billion-dollar disasters serves as a clear signal – investing in resilience now can help manage and reduce future disaster costs. By taking proactive measures, we can build a safer, more sustainable future that mitigates these rising risks. However, there is no strategic resiliency investment strategy for the nation.[35]

Responsibilities for parts of national resilience are fragmented among many agencies. Questions remain unanswered, including:

- What is the role of disaster mitigation and resiliency to overall national resiliency? Is the U.S. investing enough in pre- and post-disaster mitigation?
- What are the roles and contributions expected from Federal actions versus SLTT actions?
- How much of the resiliency budget is expected to be spent by private asset owners, including through P3? What is the strategy to incentivize such investments?

[34] National Institute of Standards and Technology, April 2022. Assessment of Resilience in Codes, Standards, Regulations, and Best Practices for Buildings and Infrastructure Systems, NIST Technical Note 2209.
[35] U.S. Government Accountability Office, September 2017. Climate Change: Information on Potential Economic Effects Could Help Guide Federal Efforts to Reduce Fiscal Exposure. GAO-17-720.

- What is the role of building codes for both buildings and other infrastructure? What does resilient infrastructure mean and how is it measured?
- How can the U.S. facilitate building resilient new infrastructure? How can the U.S. incentivize and pay for upgrading existing infrastructure to resilient standards?
- What is the role of specific agencies, and what are the mechanisms for coordinated action by the Federal government?

The Mitigation Framework Leadership Group (MitFLG) is a national coordinating structure for mitigation created by the PKEMRA of 2006. After Hurricane Sandy (2012), the Sandy Recovery Improvement Act of 2013 required FEMA to develop a National Mitigation Investment Strategy. In 2019, FEMA issued the strategy. The strategy lays out three goals: (1) show how mitigation investments reduce risk; (2) coordinate mitigation investments by the whole community to reduce risk through shared risk information, reinforce strategies for risk reduction, and provide easier access to risk funding; and (3) make whole community mitigation investment standard practice.

In 2024, FEMA also issued resiliency guidelines.[36] In the guidelines, FEMA defines resilience as "the ability to prepare for threats and hazards, adapt to changing conditions, and withstand and recover rapidly from adverse conditions and disruptions." This definition applies resilience to people, society, the economy, the built environment, and the natural environment. Many interconnected systems support these aspects of resilience.

Despite these efforts, there is no outcome-focused strategy that defines goals to be achieved and the roles of various participants including FEMA, other Federal agencies, SLTT emergency managers, Chief Resiliency Officers, SLTT infrastructure agencies, private asset owners and operators, and funding and financing organizations.

3.5.12. Nature-based solutions are a potential solution for resiliency needs.

The NIAC has noted in this report the very large investments needed in resilient infrastructure. Costs for such infrastructure are based on traditional or "grey" infrastructure. Global experiences with grey infrastructure have shown that these structures are expensive, carry many negative tradeoffs, and are not aligned with natural processes. Eventually, natural processes can and do overwhelm these structures. Nature-based solutions are a potential answer to both financial and resiliency challenges. According to the ASCE, Nature-based solutions "align natural and engineering processes to deliver infrastructure that provides economic, environmental, and social benefits."[37]

Data from many nature-based projects around the world indicates that nature-based infrastructure (NBI) is up to 50% cheaper than traditional "grey" infrastructure.[38] The cost-savings come not only from the original cost of the infrastructure but also from maintenance costs. In addition, such projects can also provide other benefits such as greenhouse gas emission reductions, ecosystem restoration, public-use facilities, and wildlife restoration. There is also an expectation that such structures are more resilient when faced with extreme weather.

[36] Federal Emergency Management Agency, U.S. Department of Homeland Security, August 2024. National Resilience Guidance: A Collaborative Approach to Building Resilience.
[37] American Society of Civil Engineers, July 2024. ASCE Policy on Nature Based Solutions.
[38] Nature Based Infrastructure Global Resource Centre, 2021. How Can Investment in Nature Close the Infrastructure Gap? An estimate of how much nature-based infrastructure can save costs and create value relative to traditional grey infrastructure.

A few Reimagining Disaster Response and Resiliency Subcommittee briefers mentioned successful examples of nature-based solutions, including the following projects:

- The USACE, the Natural Resources Conservation Service, and the Nature Conservancy have collaborated on a project on the Mississippi River to purchase easements for farmers. Marginally arable land is turned into conservation easements, providing benefits to farmers, and assisting in wildlife and ecological restoration as well as flood control.
- Chestnut Bay, a proposed 7.8-acre constructed wetland in Conway, South Carolina, is funded by BRIC. The project includes a community park for public use and is designed to store stormwaters during weather events.
- Another project in South Carolina uses Crabtree Swamp and its floodplain for additional stormwater storage. This project is a collaboration between local emergency managers, private engineers, contractors, universities, and The Nature Conservancy of South Carolina. In applying for a BRIC grant, South Carolina applicants found quantifying the costs and benefits of their nature-based solution challenging.

3.5.13. States and local jurisdictions are mounting resiliency initiatives.

The Reimagining Disaster Response and Resiliency Subcommittee heard from the National Conference of State Legislatures and SLTT jurisdictions on significant resiliency initiatives. [39] Some of jurisdictions have raised significant funds for resiliency through bonds. Harris County, Texas, raised $2.5 billion in 2018 through a local bond (85% approval) and matched it with $2.7 billion of other funds, including almost $864 million in CDBG-MIT funds. New York State raised $4.2 billion in 2022, for which 68% of New Yorkers voted in favor of.

New York State Bond Act funds are allocated to four purposes: school vehicle electrification, reduction in greenhouse gas emissions and green roofs, water infrastructure to reduce flood risks including dam removal, and land conservation including farmland easements and buyout of repetitive flood loss properties. Buyouts were selected for the Bond Act, as the CDBG-funded program for buyouts was over-subscribed, and buyouts have an excellent mitigative effect (for every dollar invested they save $9 of damages prevented). Several of the programs use a revolving loan structure so that funds can be reused over time.

Harris County, Texas, is using its funds for several projects, such as: widening and deepening the channel in the Hunting Bayou; replacing, modifying, or improving many bridges; and creating a stormwater detention basin. The $100 million project is expected to reduce the risk of flooding for 4,450 homes and is funded 60% by USACE and 40% in bond funds. Harris County has Flood Control Proposition A on the ballot, seeking to raise property taxes by $0.01581 per $100 valuation (current rate is $0.03105 per $100 valuation). The funds are for catching up with deferred maintenance as well as operations and maintenance of new flood control infrastructure. CDBG funds cannot be used for operations and maintenance.

There are many lessons to be learned from these resiliency initiatives, including the following:

- Local or state funds are raised after compounding disasters, including at least one seminal disaster.
- Most large resiliency programs are combining locally raised funds with Federal funding, often from multiple sources (e.g., FEMA, HUD, USACE, USDA).

[39] National Conference of State Legislators, November 2023. “State Policy Considerations for Disaster Risk and Resilience.”

- Government, non-profit, private industry, academia, and civil rights groups have coordinated to form many traditional and non-traditional groups such as advisory councils, task forces, commissions, or standing non-governmental organizations to lead or guide efforts.
- 26 states currently have Chief Resiliency Officers leading large resiliency initiative.
- Disaster management organizations are involved, in most cases, for their access to FEMA and CDBG funding (e.g., FMA, HMGP, BRIC, Swift Currents, CDBG-MIT), BCA expertise, hazard mitigation planning, and some access to data (e.g., repetitive flood loss properties).
- Resiliency programs develop innovative, nontraditional, holistic, sometimes nature-based solutions to address long-term risks and create co-benefits such as recreation areas, green jobs, or serving underserved communities.

3.5.14. Private companies eager to invest in U.S. infrastructure face roadblocks.

The NIAC has noted in this report the magnitude of investments needed in resiliently updating U.S. infrastructure. Funding all needs solely through the Federal budget, or only government financing, may not be feasible. Global capital flows dwarf the size of the U.S. Federal budget. Additionally, the U.S. has always been able to attract significant global funds. The U.S. has consistently ranked as the best place to invest in private infrastructure investment, especially because of the IIJA and the CHIPS and Science Act. The Subcommittee heard from a group representing 110 of the leading global infrastructure investors, amounting to a combined worth of $2 trillion in infrastructure investments across 68 different countries. These investors have about $500 billion currently, ready to invest.

Private investors are comfortable with the ownership model (85% of U.S. infrastructure is privately owned). However, there are other feasible models for private sector involvement. P3s provide an additional model. However, there is no national-level P3 authority in the U.S. Each state has its own structure and regulations for how P3s can be implemented. As one Subcommittee briefer mentioned, “if you have done one P3 project in the U.S., you have only done one P3 project in the United States.”

A 2016 initiative to promote public-private financing led the U.S. Department of Transportation (DOT) to create the Build America Bureau. The Build America Bureau combines funding from several sources, including from the Transportation Infrastructure Finance and Innovation Act (TIFIA) program. Since 1999, the TIFIA program has provided over $37 billion in loans and assisted in the investment of $132 billion in infrastructure. About one-third of total projects used the P3 model.

Another possible source of funding is Private Activity Bonds. While this report has already detailed the option of state and local financing through municipal bonds, there is another method for states and municipalities to finance infrastructure activity – through private activity bonds. Private activity bonds allow SLTT governments to allow private entities to use their Federally conferred authority to use the government’s lower interest rates for infrastructure development. These bonds are subject to Federal, including IRS, rules.

Private activity bonds have been used after disasters. Congress has created special zones after major disasters where tax-exempt private activity bonds could be used to boost economic growth. These include Liberty Bonds after 9/11, Gulf Opportunity Zone Bonds after the 2005 hurricanes, and the Mid-Western Disaster Recovery Bonds after severe flooding in 2008.

There are a few examples of P3s where private corporations provide some degree of funding in exchange for equity. One P3 example is a pilot program in St. Paul, Minnesota, where a former automobile plant,

prone to flooding, was rehabilitated and replaced with a nature-based solution that includes single and multi-family residences and recreational spaces.

3.6. Survivor Services, Preparedness, and Roles

People are the "raison d'etre" for disaster response and resiliency and are also a vital part of the disaster system. Survivors are actors in the system: they are either prepared or not, respond quickly or slowly, and bear the consequences of response and resiliency actions. Presidential Policy Directive 8 states that U.S. "national preparedness is the shared responsibility of all levels of government, the private and nonprofit sectors, and *individual citizens*."

Also, disasters do not impact people equally. They magnify vulnerabilities and inequities in society, and one size does not fit all circumstances. There is an ongoing tension in disaster management between providing resources for the vulnerable and marginalized and incentivizing those who can and do engage in greater personal responsibility and resiliency.

3.6.1. Compounding disasters have major effects, especially on vulnerable populations.

The same communities and survivors are repeatedly buffeted by disasters without a chance for recovery in between. This is especially falling hard on already vulnerable populations, including individuals with access and functional needs, and specifically with regard to housing.

The FEMA Transitional Sheltering Assistance Program provides 18 months of market rent for survivors, expecting that surviving households will find alternate housing within that timeframe. However, low-income disaster survivors find that housing they can afford, limited in supply before disasters, is more severely constrained after disasters. Many survivors are not able to find alternate housing after the Transitional Sheltering Assistance benefits expire. Briefers to the Subcommittee stated that this increases homelessness after major or compounding disasters.

Disaster assistance can also have unintended consequences. For example, recovery funds and insurance proceeds are often used by landlords to upgrade rental properties. However, the upgraded properties are then priced at higher rents, often out of reach of the previous tenants. Most of these properties are not "affordable housing," so there is no mandate to continue to rent to low-income tenants.[40] Workforce housing is another victim of disasters. These are generally older homes rented by small landlords. Disaster funds and insurance proceeds allow for the gentrification of these homes, pricing them out of reach of the workforce for whom it was primary housing. Workforce housing is often occupied by first responders, teachers, and workers in manufacturing or retail.

There are significant problems with affordable housing that benefits from HUD funds and meets the Department's criteria. There are several organizations that build and provide affordable housing, and they acknowledge that there is a severe national shortage of affordable housing. Many of the renters in these homes are already over-burdened with rent in comparison to their income. Affordable housing providers are also concerned. Housing costs increase after each disaster, and the rising costs are exacerbated by higher construction costs, strangled supply chains for construction and retrofitting, labor shortages, and an

[40] HUD defines affordable housing as housing that a household can afford spending no more than 30% of their income.

increase in total insurable values while there are declining investments. The final straw may be the rising cost of property insurance.

3.6.2. There are gaps in individual preparedness and resiliency.

Individuals are key to the national response and the whole of society's resiliency. However, most people often do not know of local risks, what is expected of them in terms of preparedness, and what actions they should take to be more resilient. If citizens are aware of risks, preparedness, and resiliency they may not have the resources to do what is needed. For example, it was a maxim in emergency management that survivors should plan to be self-sufficient for 72 hours after disaster impact. Even local government, let alone the Federal government, can be right at the survivor's doors within hours after impact. However, many may not have the economic resources to stockpile food and water and fend for themselves for 72 hours. This is especially true among vulnerable populations such as older adults, people with disabilities, and individuals with access or functional needs who may also require access to accessible resources, which can be expensive and in limited supply.

The devastating wildfires in Maui underscored a critical gap in public education regarding local risks and emergency response strategies. While residents were well-informed about the dangers of tsunamis and hurricanes, there was a significant oversight in preparing the community for other potential threats, such as wildfires. This lack of targeted education and preparedness contributed to the tragedy, highlighting the need for more comprehensive public awareness campaigns that address the full spectrum of risks specific to an area.

Maui's public warning system, designed primarily for tsunami alerts, was not utilized during the wildfires because activating the sirens could prompt residents to evacuate toward the flames rather than away from danger. This situation reveals a crucial flaw in the current approach to public warnings and evacuation planning. The absence of clear, hazard-specific evacuation routes and the lack of public knowledge about how to respond to different types of emergencies left many residents unprepared and vulnerable.

The Subcommittee heard from wildland fire experts who emphasized the importance of managing the landscaping around structures at the urban-wildland interface. The disaster management system has worked for decades to strengthen building codes, land use regulations at the community level, and floodplain management. Wildfire management points out that property-level issues can also have a significant effect on outcomes – whether it is good or bad.

3.6.3. The disaster response system is not responsive to survivors with access and functional needs.

The U.S. Centers for Disease Control and Prevention (CDC) defines access and functional needs as individuals with disabilities, older adults, people with limited financial resources, limited access to transportation, or limited English proficiency. One in four U.S. adults is disabled, which rises to two in five for those over 65 years. Older adults also have more chronic conditions.

Individuals with access and functional needs are disproportionately impacted before, during, and after disasters. Traditionally, they experience greater human suffering and overall loss of life than the general population. For example, in the aftermath of Hurricane Katrina, where about 1,700 people died, 75% of the deceased had an access or functional need.

The Subcommittee heard of the lived experience of individuals with access and functional needs who experienced challenges receiving accessible emergency alerts, notifications, and warnings; accessing disaster-related information in American Sign Language and in 508-compliant formats; securing accessible emergency evacuation transportation resources; and maintaining their health, safety, and independence following events due to a lack of physically and programmatically accessible emergency shelters. The disproportionate impact disasters have on people with access and functional needs is greatly exacerbated by the fact that, historically, they have not had the opportunity to be fully integrated throughout the emergency management process. The emergency management system has, in large part, been designed for, and by, individuals who can run, walk, see, and hear.

The State of California adopted an innovative model to address these barriers in meaningful ways by establishing the OAFN within the Governor's Office of Emergency Services. The OAFN is helping to reduce the impacts disasters have on underrepresented communities while providing greater access to the lifesaving emergency management-related programs, services, and resources utilized before, during, and after events. As the first and only office of its kind in the nation, OAFN is led by a gubernatorially-appointed, senior-level executive tasked with partnering with emergency managers, community-based organizations, and whole-of-community stakeholders to ensure the needs of all individuals, including people with disabilities and older adults, are identified and integrated throughout every facet of the emergency management process.

California leverages an approach to inclusion and integration, which includes providing technical assistance, guidance, facilitation, partnership outreach, training, and other support services to emergency managers, community stakeholders, and service providers responsible for planning, preparing, responding to, and recovering from, all hazards. This encompasses an inclusive response to major disasters in support of the whole community and supports local jurisdictions as they work to provide effective communication, evacuation, sheltering, and recovery operations.

Public education regarding whole-of-community considerations, improving accessible emergency communication, promoting inclusive evacuation planning, and furthering the physical and programmatic accessibility of shelters helps underrepresented communities become better prepared to face the full range of risks they may encounter. This increases the safety and resilience of residents and strengthens the overall effectiveness of emergency response efforts.

Specifically, unless deliberate planning action is taken, public warning, evacuation, and sheltering all have the potential to fall short of meeting the human needs of survivors with access and functional needs. At worst, our fellow survivors with such needs may become part of a grim statistic.

3.6.4. Federal programs for survivors' assistance are fragmented, slow, and unequitable.

When American citizens need a helping hand, the expectation is that relief will be almost immediate. However quickly Federal agencies try to provide disaster assistance, it is not fast enough for those left without a roof over their head, with concerns about their daily living expenses and their livelihood. But disaster assistance programs are fragmented, slow, and often inequitable.

Many Federal agencies have programs to assist survivors directly after disaster, especially FEMA, HUD, SBA and U.S. Department of Health and Human Services (HHS). Federal disaster assistance programs provide the following services: lodging expense reimbursement; rental assistance; home repair/replacement assistance;

accessibility needs; funding for privately-owned roads, bridges, and docks; multifamily lease and repair; transportable temporary housing units; mass care; disaster case management; crisis counseling; disaster legal services; unemployment assistance; and disaster loans, among other services.

Disaster assistance programs are fragmented, slow, and uneven. Each Federal agency has its own application program and set of rules. They perform duplicative functions, such as multiple inspections of the same property.

Disaster assistance programs do not discriminate but outcomes are often not equitable. Many reports have indicated that survivors with better understanding of online tools and with access to disaster information are able to self-serve faster and get more benefits. This situation was aggravated during the COVID-19 pandemic, with online registrations, and continues as agencies have adapted to a greater online application process. The elderly are less able to navigate the application process, and the marginalized often distrust government and lack confidence that they could benefit from its programs. The applications and appeals processes are daunting, confusing, and not transparent.

3.6.5. Tribal nations have some of the highest needs after disasters.

The Subcommittee's SLTT recovery panel included participation by two tribes. The information imparted was especially disheartening. Disasters expose the vulnerabilities of communities; in the case of Tribal nations, it is apparent that many are facing disproportionate disparities with other, non-Tribal communities. Until 2013 and the Sandy Recovery Improvement Act, tribes could not request a direct disaster declaration but had to go through a state. Tribes are still not eligible for EMPG funds – the basic building block of emergency management. Some states share their EMPG funding with tribes, others do not.

Tribal culture and traditions are not consonant in some cases with the disaster recovery system. Some tribes own the lands on which people live but Federal assistance and recovery programs are based on establishing ownership of the structure to base compensation decisions. Some tribes had no internet availability until funding for broadband became available during the pandemic. Since several assistance programs are based on individuals applying for assistance, the lack of connectivity can become a major hurdle. The Tribal Homeland Security Grant, according to briefers, pays out three cents per person compared to the dollar per person that the rest of the country is awarded. Many tribes lack a tax base and are not able to self-fund emergency activities.

Tribes face additional hurdles after disasters. Some Tribal homes are made of traditional adobe blocks. FEMA inspectors have trouble understanding this building technology, and damage assessments are very low. Even though tribes are eligible for BRIC and other grants, without much ongoing support for emergency management, tribes find it challenging to apply for disaster recovery or mitigation grants.

3.7. Insurance is Becoming Inaccessible or Unaffordable in Some States and Regions

Insurance is a principal risk transfer mechanism to manage potential economic losses from disasters. Both housing and infrastructure owners use property insurance, whether from third-party sources or as self-insured (the latter is pursued by many governments for public infrastructure).[41] Sophisticated organizations

[41] There are other forms of insurance affected by disasters, such as unemployment insurance, that this report does not address.

at the Federal and SLTT levels also employ backstops against insurance through reinsurance with third-party companies, catastrophe bonds, or rainy-day funds.

Insurance costs have been rising, not just in the U.S., but globally. Swiss Re, a reinsurance company, projected that insurance rates globally will increase about 5.3% per year through at least 2040. According to Swiss Re, climate change is the principal driver of the increase, accounting for 33 to 41% of the premium increase.[42]

Insurance payments are more beneficial for survivors after a disaster than government assistance. FEMA assistance does not make a disaster survivor whole. In fact, the average FEMA disaster award is about $5,000 per household. SBA disaster loans must be paid back.[43] Flood insurance is expected to pay 85% of the losses to NFIP policyholders, whereas Federal disaster assistance is expected to cover only 20% of the flood losses for uninsured homeowners.

Fire insurance is almost entirely provided by private insurance companies, either as a part of homeowner's insurance or separately as wildfire insurance and regulated by state insurance regulators. Wildfire threats used to be seasonal but now occur year-round, becoming larger and more dangerous. Wildfire activity is also becoming more common in other areas such as the Southeast and Northeast U.S. Analysts have estimated that $644 billion in property is at risk of wildfire in the 15 states with maximum acreage affected by wildfires between 2002 and 2019.[44] Across the country, an estimated 49 million homes are situated in the wildland-urban interface, which amounts to one-third of all housing units in the nation.

The devastating wildfires of 2017 and 2018 swept across the Western U.S., with California alone facing a staggering $20 billion in insurance losses. According to insurers, this magnitude of loss was twice the total profits from fire insurance in the decades since the 1990s. Wildfire coverage rates have risen dramatically, if homeowners can even find an insurer willing to provide coverage. State regulators have sometimes prohibited insurers from dropping insureds, which may have contributed to further turbulence in insurance markets.

The NFIP is a government program that provides about 95% of all flood insurance in America. According to the 2022 FEMA Watermark report, the NFIP provides $1.28 trillion of flood coverage for over 5 million policyholders.[45] Flood insurance payments have increased 20 times in the first two decades of this century, seven times the growth rate of Medicaid over the same timeframe.[46] The program has a more than $20 billion debt to the USDT dating back to Hurricane Katrina in 2005. The CBO estimates that the program will continue to run at a loss and accumulate debts of around $6.3 billion from 2022 to 2032.[47]

Some $3 trillion of property nationwide is at risk of flooding. Flood insurance is mandatory for Federally mortgaged properties in the SFHA in communities. It is voluntary for everyone else. However, studies in 2019 indicated that less than 60% of the homeowners in SFHAs purchased flood insurance, even though, at the time, premiums were subsidized roughly by two-thirds.[48] That is better than the 5% who had flood

[42] Holzheu, T., Lechner, R., Vischer, A., Bevere, L., Staib, D., Finucane, J., Belgibayeva, A., & Fan, I., April 2021. "More risk: the changing nature of P&C insurance opportunities to 2040" Swiss Re.
[43] FEMA. "Disaster Assistance vs. Flood Insurance: Do You Know the Difference?" October 1, 2021.
[44] Jeffery T. et al, September 2020. Wildfire Report (CoreLogic, September 2020).
[45] Federal Emergency Management Agency, "The Watermark - National Flood Insurance Program Financial Statements," March 6, 2023.
[46] Gaul, Gilbert M, 2019. The Geography of Risk: Epic Storms, Rising Seas, and the Cost of America's Coasts. Sarah Crichton Books.
[47] Congressional Budget Office, November 2022. How CBO Analyzes Public-Private Risk Sharing in Insurance Markets.
[48] Wagner, Katherine R. H. "Adaptation and Adverse Selection in Markets for Natural Disaster Insurance." *AARN: Natural Disasters (Topic)* (2019).

insurance in SFHAs in a 2006 study, which also noted that only 3% of single-family homeowners in communities who participated in the NFIP purchased flood insurance.[49]

In response to the losses of the NFIP, in 2021, FEMA changed the basis for calculating premiums – this change is known as Risk Rating 2.0. Prior to 2021, premiums were based on the insured structure's elevation above the flood levels on the flood insurance rate map. Risk Rating 2.0 is an attempt to put the NFIP on a sounder actuarial basis.

Risk Rating 2.0 has been controversial in several flood-prone regions. The sticker shock of higher premiums has affected many residents in coastal regions, especially along the Gulf Coast. FEMA's disaster policies require homeowners in the SFHA to maintain flood insurance if they want to remain eligible for post-disaster assistance. This is to prevent multiple payouts in disasters for the same property. There are some leniencies built into the rules, but with rising disaster frequency, survivors can find themselves not eligible for any disaster aid.

3.7.1. Insurance payments for public buildings and infrastructure are problematic after major disasters.

When public infrastructure is damaged, the FEMA PA program helps states and local areas assess total losses. FEMA then deducts any expected insurance proceeds, and the Project Worksheet reflects the remaining costs. However, it is common for states and counties to engage for months or even years with their insurance companies, sometimes including litigation, to resolve and receive the insurance proceeds. This creates considerable uncertainty in budgeting for recovery projects.

Many governmental organizations have opted to use some measure of self-insurance in their assets. An analysis by RAND's Homeland Security Operational Analysis Center compared data from January 2008 to June 2018 and found that state and local governments insure for about 28% to 46% of disaster repair costs.[50] The Pew Research Center found similar results with most states using a combination of self-insurance and private-market insurance to cover potential disaster costs.[51] Many states and some large cities also have rainy day funds to pay for disaster costs.

3.8. Emergency Management Lags in Technology and Data Utilization

In an era where data and technology drive innovation across industries, emergency management remains alarmingly behind the curve. From FEMA to SLTT organizations, the sector's outdated approach to data and technology exposes its "soft underbelly."

While the world races toward AI and real-time data application to solve complex problems swiftly, many emergency management agencies are still grappling with basic digital record-keeping. This technological lag is not just a weakness—it's a significant threat to the effectiveness and timeliness of emergency response.

The root of the problem lies in the emergency management marketplace's limited appeal to digital companies, which see little business incentive in developing and marketing software tailored to the unique

[49] Dixon, Lloyd, Noreen Clancy, Seth A. Seabury, and Adrian Overton. The National Flood Insurance Program's Market Penetration Rate: Estimates and Policy Implications. Santa Monica, CA: RAND Corporation, 2006.
[50] Dixon, Lloyd et al, 2020. Insuring Public Buildings, Contents, Vehicles and Equipment Against Disasters: Current Practices of State and Local Government and Options for Closing the Insurance Gap. RAND, 2020..
[51] Pew Charitable Trusts. May 12, 2020. "How States Pay for Natural Disasters in an Era of Rising Costs."

needs of the sector. Consequently, with few exceptions, the burden of creating emergency management-specific software has fallen on FEMA, which then shares these tools with SLTT partners. This limited innovation pipeline hinders the sector's ability to leverage cutting-edge technology.

Data is another critical issue. The success of AI-driven solutions hinges on vast, high-quality datasets, yet many emergency management organizations lack the infrastructure and resources to collect and maintain such data. The impressive AI applications developed by California Department of Forestry and Fire Protection (CAL FIRE) and the University of California-San Diego (UCSD), for instance, were only possible because of two decades of continuous data collection and the installation of advanced cameras. Without similar long-term data initiatives, many emergency management agencies will remain locked out of the advanced technological capabilities that could dramatically enhance their operations.

The consequences of this technological and data deficiency are profound. As disasters become more frequent and severe, the ability to harness data and technology is not just an advantage—it's a necessity. The sector must urgently prioritize building a robust technological backbone and cultivating data-rich environments to stay ahead of emerging threats and ensure a resilient, rapid response to any crisis. Such a backbone would also help to address the current lack of access and functional needs-specific data required to develop the innovative technologies, programs, and software required to enhance response and recovery operations among vulnerable communities.

Key disaster agencies (FEMA and HUD) agree that they are struggling to catch up with data and technology, including basic housekeeping software programs.

HUD's Disaster Recovery Grant Reporting system is legacy software that is showing its age, but the agency has no standing funding to upgrade it or create new capabilities. FEMA provides billions of dollars yearly for mitigation and resiliency. Yet, just recently, the agency has developed a tracker to show where projects have been funded. A dashboard is expected shortly.

HUD CDBG programs have provided over $100 billion in funding for recovery programs since 2005 when Hurricane Katrina struck Mississippi and Louisiana. Probably over 1,000,000 properties have received CDBG funding. For each of these, states or localities collected detailed data on the structure, insurance, damages, and repair methods. Many of these homes subsequently are affected by new disasters. This data, if aggregated across the states, would be a treasure trove to show the effectiveness of recovery activities. Data on mitigation and their protective effect during subsequent disasters will be helpful to convince the insurance industry to reduce premiums or at least slow down the rate of increase of premiums.

SLTT governments face their own challenges, at minimum, with record-keeping after a disaster. The larger the disaster, the larger the torrent of data, forms, reports, and information generated, utilized, and stored. Getting ahead of this tsunami is imperative to managing recovery programs successfully all the way to eventual closeout. Few states or jurisdictions that have had a major disaster for the first time in a few years have this infrastructure already in place. There is also no cross-agency, integrated database of all mitigation and resiliency projects spanning FEMA, HUD, DOT, EPA, and/or DOE, etc.

Disaster management cannot become efficient, cost-effective, and responsive without a massive influx of advanced technology. Data is the foundation for such a renaissance.

4. Recommendations

Unless drastic changes are implemented in how the U.S. manages disasters, the economic impacts and loss of life will continue to grow at unacceptable rates. To make a difference, the Federal government must focus on those facets of dealing with disasters that are uniquely Federal in nature and provide funding, guidance, and regulations for those that should be in the hands of SLTTs and the private and non-profit sectors.

Financial – The costs of today's disasters are often beyond the capability of SLTT governments. The Federal government should continue to provide an appropriate backstop using Federal dollars to help those governments maintain their normal services while dealing with the impact of larger disasters. These funds should be quickly provided and managed in a way that places value on the speed and effectiveness of recovery. The process for receiving and utilizing those funds should provide flexibility for jurisdictions to meet their needs, but expectation is that the results should reduce the impact of future disasters so that taxpayers do not pay for the same effort twice. This will require reconsidering, consolidating, and appropriately funding programs instead of the arcane, underfunded, and underutilized programs that exist today. To truly make a difference, more money should be used to mitigate future disasters and to recover from them. Additional attention should be given to ensure that funds aimed at addressing the specific needs of underrepresented communities are allocated expeditiously without placing undue burdens or hurdles on impacted individuals.

Standard Setting – In the absence of appropriate standards, the cost of the disaster shifts from the individual, owner, builder, community, industry, etc. to the Federal government. The U.S. must ensure that the true cost of the life of a structure is considered from the outset. In doing so, the U.S. will reduce the likelihood of spending Federal dollars on the structure because it was built in a flood plain, was unprepared for seismic activity, or was uninsurable, etc. By coordinating and, in some cases, regulating land use, building codes, and/or insurance standards, etc., the Federal government can shift those costs to the appropriate party and create more resilient communities.

Capacity Building—Through improved AARs funded by the Federal government and used to improve training and exercises, the U.S. can create a national workforce owned by SLTT governments that can surge and be shared, reducing the reliance on Federal resources. Although these programs exist today, they are not funded at a level that will meet future needs.

Bottom Line —The Federal government can best meet the future disaster needs of the U.S. by focusing on programs that enhance our national capabilities, which primarily exist outside of the Federal government. Only those areas that are truly the purview of the Federal government should reside there.

The following recommendations provide specific details.

4.1. Disaster Funding

4.1.1. FEMA's Disaster Relief Fund must be properly resourced.

The NIAC recommends expanding FEMA's budget, including its regular budget and the DRF, to enable it to take on more response and recovery missions. Increased preparedness funds are crucial for building capacity to manage the growing frequency and severity of disasters. Additionally, more DRF funding will be

essential to effectively respond to an increasing tempo of disasters and expanded responsibilities. This will ensure that FEMA has the resources to respond effectively when crises strike.

4.1.2. Transform FEMA's PA Program into a block grant.

The NIAC recommends converting the FEMA PA program into a block grant program, like the CDBG program model. This change would allow greater flexibility in implementation, addressing the complexities that have emerged despite efforts to streamline the PA program. With the increasing frequency of major disasters, a block grant approach is essential to enhance efficiency and responsiveness.

Currently, PA funding is allocated based on damage assessments, a process identified as slow and problematic in the 2023 PA assessment. By shifting to a block grant program, Congress would allocate specified amounts for designated disasters, allowing recipients greater autonomy in recovery efforts. While this transition may not resolve all issues—such as the complexities of environmental and historic preservation requirements—it could simplify funding management and enhance community resilience.

Many details will require reconsideration, including management costs, ensuring that funds are used for disaster recovery and resiliency, and applying Federal guidelines, such as those incorporated into 2 CFR 200. It may be feasible to review cost-share requirements under a block grant approach and consider further ways to incentivize SLTT commitments to recovery and resiliency.

A block grant model would particularly benefit underprivileged communities that struggle to navigate the existing, complex PA program. However, experience with HUD's CDBG program shows that Federal guidance and capacity-building efforts will remain crucial. Therefore, the NIAC recommends that FEMA update the NDRF to acknowledge all available Federal recovery programs and provide some models for organizing large-scale, multi-faceted recovery efforts.

Converting FEMA recovery programs to block grants will also alleviate workforce shortages. The prescriptive nature of PA program rules and the low-risk tolerance for errors and omissions require considerable staff attention over an increasing number of grantees. Changing to a block grant model could alleviate this workforce shortage that affects FEMA and all SLTTs.

To further bolster recovery initiatives, FEMA should require grantees to develop recovery plans before disasters, including an asset inventory focusing on publicly owned critical infrastructure assets such as power, water, telecommunications, and transportation. This proactive approach would enable SLTT governments to prepare more effectively, with pre-approved policies and contracts in place.

FEMA must prioritize training and technical assistance for SLTT grantees and subgrantees, equipping them with the knowledge and resources needed for effective recovery. By implementing these changes, FEMA can significantly improve the disaster recovery landscape, ensuring a more resilient future for all communities.

4.1.3. Increase the disaster threshold.

The Stafford Act requires the President to "promulgate and maintain guidelines," under which, a disaster declaration is likely to be approved. This is done through 44 CFR § 206.48, which sets a dollar loss indicator that should be exceeded before a Presidential major disaster declaration. This indicator amount is commonly referred to as the disaster loss "threshold," though none of the declaration criteria in the Stafford Act prohibit the President from declaring a disaster declaration regardless of loss. The threshold is based on the population of state and counties impacted and is designed to properly allocate the responsibility for smaller and medium-sized disasters to the local and state levels while allowing for Federal

support for larger and catastrophic disasters. The threshold has not kept pace with inflation, however, and consequently, more and more disasters reach the financial threshold for presidential declaration and cost reimbursement. This has shifted the financial responsibility from the SLTT, where the disaster occurs, to the Federal government.

Several government oversight entities (e.g., GAO, OIG) have studied this issue and recommended increases to the indicator amount. The NIAC recommends a structured review that results in a change to the current methodology to ensure that responsibility is appropriately assigned to each level of government.

The NIAC recommends that other factors be considered in this evaluation. The impacts of disasters in rural areas of populous states that do not have the tax base of the major cities should be noted, as well as the differing cost of infrastructure across the country. Finally, the flexibility of the executive branch should be maintained, so that new, evolving, and complex disasters can be responded to appropriately.

4.1.4. Increase EMPG funding.

As communities take on more significant responsibilities in disaster preparedness and response, expanding EMPG funding is a strategic imperative and vital to the nation's emergency management capacity.

The National Emergency Management Association (NEMA)/International Association of Emergency Managers 2022 report highlights that national investment in EMPG remains minimal, averaging just over $1 per resident, and has not kept pace with inflation or rising costs as shown in **Figure 10**. Despite this, EMPG funding—along with state and local contributions—supports significant preparedness, enabling local governments to manage over 21,000 events in fiscal year 2021 alone without Federal assistance.

Tying this funding to defined metrics for capabilities and capacity will create a robust framework for accountability, ensuring that resources are directed where they can yield measurable outcomes. When funding is linked to demonstrated improvements in readiness, resilience, and response, local governments are motivated to enhance their disaster management practices in meaningful, lasting ways. This approach not only builds public confidence but also ensures that communities are prepared to protect lives and livelihoods effectively.

Furthermore, expanding EMPG eligibility to include Tribal nations with significant populations or land size is critical for fostering resilience in these often-underserved areas. Tribal nations frequently contend with unique challenges and complex jurisdictional considerations, making direct access to disaster management funding a critical support mechanism. By incorporating defined eligibility metrics, we can empower tribes to build sustainable emergency management capacities aligned with their specific vulnerabilities and needs. An expanded and performance-linked EMPG would serve as a powerful tool to elevate disaster response and resilience across a broader array of communities, driving nationwide improvements in public safety and disaster preparedness.

With increased EMPG funding, FEMA must ensure that these funds drive meaningful performance improvements at SLTT levels. To maximize impact, FEMA should consider requiring detailed work plans with clear targets, making each dollar count toward stronger, more resilient communities.

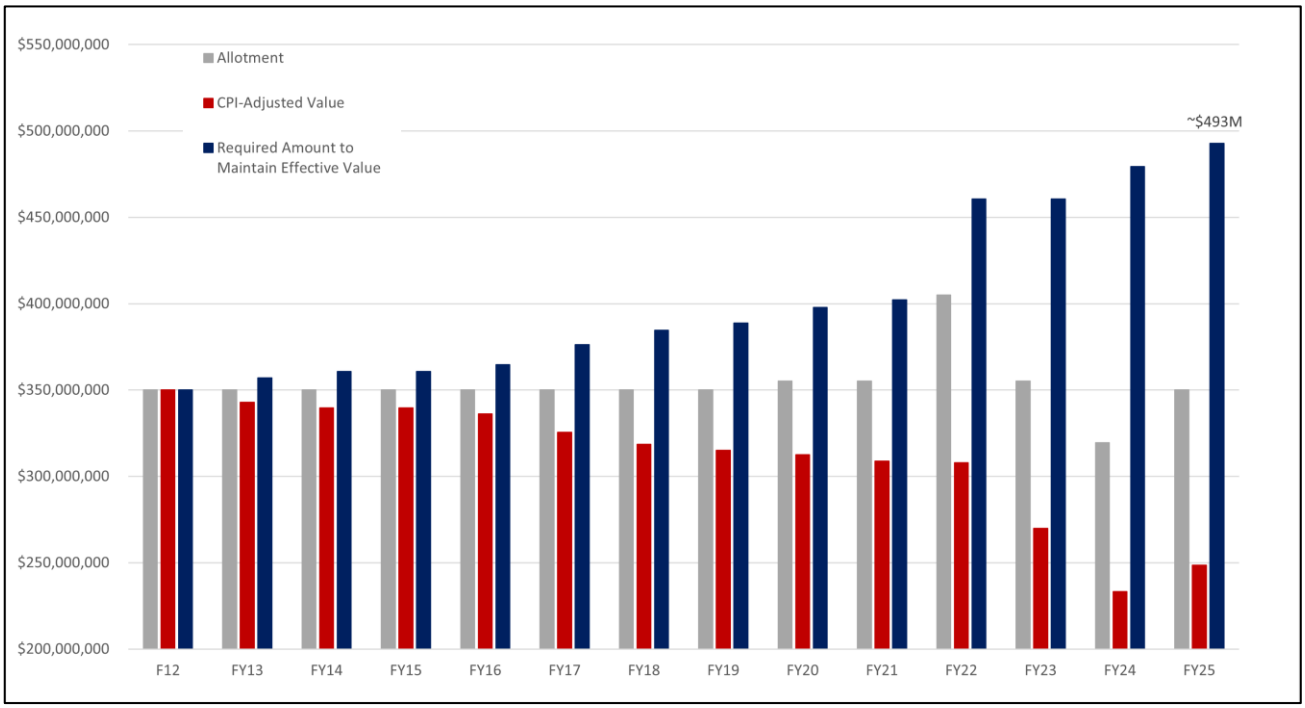

Figure 10. EMPG Funding Over Time from FY12 to FY2025 as well as EMPG with CPI-Adjusted Value and the Amount of Funding Required to Maintain the Grant's Effective Value

4.1.5. Authorize CDBG-DR and CDBG-MIT as permanent programs.

HUD's CDBG-DR program is a cornerstone of disaster recovery. Yet, its effectiveness is limited by the lack of pre-disaster funding and the delays tied to Congressional allocations for specific disasters and states. To fully leverage the impact of CDBG-DR and CDBG-MIT programs, the NIAC recommends that Congress authorize these as standing, permanent disaster recovery programs. With reliable funding, HUD could provide seamless, uninterrupted support for disaster survivors, stabilize assistance processes, and offer communities the tools and training needed to implement these programs effectively when disasters strike.

Permanent funding would also allow HUD to engage in stable rulemaking, avoiding the iterative process of adjusting rules for each separate congressional allocation. Consistent guidelines would enable even frequent disaster grantees to apply proven methodologies, ensuring faster, more reliable support. With stable funding, HUD could also focus on pre-disaster preparation, helping communities set up audit-ready CDBG infrastructure, significantly improving their readiness and response speed post-disaster.

By adopting these recommendations, the U.S. creates a more cohesive, proactive disaster response framework, evolving beyond a reactive stance. A modernized approach to CDBG funding can empower communities and ensure the disaster management system is prepared to safeguard lives in an increasingly unpredictable world.

4.2. Strengthen the Disaster Workforce to Meet Rising Demand

To prepare for an era of increasingly complex and concurrent disasters, FEMA must adopt a proactive staffing strategy designed to withstand worst-case scenarios. This includes planning for multiple simultaneous disasters or scenarios in which critical resources, such as those from DOD and the National Guard, are unavailable due to military mobilization. In the face of mounting threats, FEMA's workforce must be capable, scalable, and ready to operate effectively under the most challenging conditions.

Currently, the DOD is working to create a skills inventory for National Guard and Reserve forces, identifying personnel with unique skill sets in high demand and limited supply—skills crucial for both defense and disaster response. These specialists, however, may be unavailable to support domestic emergency operations if called upon for national mobilization. This potential gap could leave FEMA and other emergency response agencies without access to the most specialized skills needed during a crisis, such as engineering, cybersecurity, communications, and medical support.

Simultaneously, volunteerism—a key pillar of the disaster response ecosystem—is under strain, with demographic and financial pressures leading to a reduction in volunteer availability. As the nation's needs grow, the U.S. faces a scenario where the civilian and military assets traditionally relied upon during emergencies may be insufficient or, worse, unavailable.

To address this, FEMA should consider contingency staffing plans that account for resource limitations and work towards fostering a resilient, self-sufficient workforce that can operate independently of external support when necessary. By developing cross-trained teams, strengthening partnerships with SLTT emergency responders, and investing in workforce flexibility and innovation, FEMA can better prepare for future crises. Additionally, partnerships with private sector and community-based organizations could provide alternative pathways to access specialized skills, filling the potential gaps left by DOD and National Guard personnel.

A robust, worst-case staffing strategy will ensure FEMA can adapt to rapidly changing conditions and continue to protect communities even amid unprecedented challenges. In building this resilient framework, FEMA will empower its workforce and, in turn, the communities they serve, with the resources and expertise to navigate the uncertainties of tomorrow's disasters.

4.2.1. FEMA should implement a whole-of-nation surge force.

A comprehensive workforce strategy is essential. FEMA must expand its recruiting efforts, strengthen retention programs, and build a more resilient talent pipeline. Investments in partnerships with educational institutions and targeted incentives could attract new talent to the emergency management profession. Additionally, closer coordination with SLTT governments, the private sector, and national entities would help distribute the workload and reduce the strain on FEMA's core staff and a few highly skilled individuals.

FEMA needs to build a whole-of-nation surge force. To build a robust and scalable response capacity, FEMA should integrate non-profits and private sector organizations into its surge force. These groups bring unique skills and resources that can significantly enhance FEMA's effectiveness during crises. Strategic partnerships with these organizations – the disaster industrial base – will provide FEMA with a diverse range of expertise and resources, ready to deploy at a moment's notice. FEMA should review borrowing personnel from SLTT government agencies. By leveraging the EMAC framework, as successfully done in 2017, FEMA can tap into a broader pool of resources during times of crisis.

To strengthen disaster response, FEMA must enhance its capacity to train the workforce in fundamental skills. Currently, the agency faces significant challenges in providing training to all who need it, limiting its effectiveness in preparing personnel for critical roles. To equip FEMA's cadres and reservists for real-world challenges, the agency needs standardized, accessible training. Training should be accessible to all personnel, with paid participation and the technology needed for effective engagement.

Ongoing professional development opportunities, such as advanced certifications and clearer career advancement paths, will enable reservists to stay current and build long-term careers within FEMA.

Mandatory cultural and language training specific to deployment regions will further enhance FEMA's ability to serve all communities equitably and efficiently.

This includes a concerted effort to train and certify SLTT members. Local emergency managers are the first responders during disasters. Strengthening them makes for a firmer national foundation for disaster readiness and response.

The NIAC recommends that FEMA review the U.S. Coast Guard (USCG) Auxiliary as an example. The USCG Auxiliary has over 20,000 volunteers and has contributed 4.5 million service hours, expanding the USCG's reach and capacity. The Auxiliary has its own unit structure, trains its own members, and performs both routine as well as crisis operations.

During non-crisis times, the Auxiliary is engaged in a variety of missions including encouraging maritime safety and teaching Americans boating skills, to include understanding maritime laws and requirements. During crises, the Auxiliary units assist in search and rescue, administrative functions, and many other missions, excluding actions that involve law enforcement or military functions. Auxiliary members often use their own boats and equipment. The USCG may pay some nominal charges such as fuel charges for boats used in USCG missions but does not pay for Auxiliary support.

There is a long tradition in emergency management, going back decades, of citizens volunteering to assist during disasters. FEMA could harness these sentiments to create a unit like the USCG Auxiliary. The USCG Auxiliary was created by Congress in 1939, and legislation may be necessary to establish a FEMA Auxiliary.

FEMA should also consider using retired members of operational services such as the USCG and the other Armed Services as part of the FEMA Reserves. These operational service members are vetted, trained, and often interested in further serving the nation. They should have an expedited process for review and acceptance into the FEMA Reserves. Currently, personnel retiring from DOD or the Coast Guard are not credited with any of their proven skills and competencies from their service careers. FEMA requires them to start at the bottom to re-train and prove their skillsets. The NIAC recommends that FEMA review and map the FEMA Qualification System requirements to those required for various DOD and USCG positions. FEMA may benefit in collaborating with DOD and USCG on this mapping. In some cases, DOD or USCG may be amenable to adding some missing training or skill components to their requirements to ease the transition of their retiring work force.

Recent legislation (CREW Act of 2021) allows FEMA Reservists to be able to deploy for up to 90 days without suffering potential loss of employment with their primary employer upon return. However, it appears that FEMA outreach to private sector organizations has not been comprehensive and sustained to ensure there is job protection and to encourage participation. The NIAC recommends that FEMA develop and implement a plan for outreach to public and private employers, especially those employing skillsets that are hard to fill, such as engineering.

4.3. Disaster Response Capability and Capacity Building

One of the NIAC's core recommendations is to simplify the doctrine, processes, and frameworks used nationwide. Simplicity imparts strength as response agencies at all levels of government and across agencies and departments can cohesively coordinate and interoperate together. As Albert Einstein wisely observed, "everything should be as simple as it can be, but not simpler." Simplicity is key. By universally adopting a common disaster response language and clarifying complex concepts, U.S. can forge a stronger, more prepared nation.

4.3.1. Reinforce the critical roles of HSPD-5, PPD-44, and NIMS/ICS in nation-wide incident management.

The NIAC recommends that the President issue a new Presidential Policy Directive (PPD) mandating adherence to NIMS and ICS across all Federal agencies for incidents. This directive should set rigorous training and exercise standards, with clear timeframes for key personnel to achieve proficiency. The new PPD should also resolve conflicts between HSPD-5 and PPD-44 for seamless incident response. This new PPD will mandate each agency to manage emergencies in their designated domain.

4.3.2. Clarify Federal response authorities concerning critical infrastructure.

There is a dire need to ensure the U.S. can adequately and swiftly respond to enemy attacks on our critical infrastructure. Readiness to respond as a nation is a deterrence to enemies and must be a key component of the overall national strategy to protect the homeland.

While state governors or local mayors typically lead disaster recovery, certain scenarios may necessitate a Federally led response. It is crucial for the Administration to establish clear authorities for such declarations and outline the roles of FEMA, DOE, and CISA.

By implementing these recommendations, the U.S. can create a cohesive and resilient emergency management framework that effectively integrates private-sector coordination, ensuring a swift and robust response to future challenges.

4.3.3. FEMA should streamline the National Preparedness System.

Revise THIRA for enhanced risk management.

The NIAC recommends FEMA update CPG 201 to refine procedures for THIRA. This should include operational definitions of hazards—such as forewarning time, onset speed, impact area, and severity—tailored to the unique characteristics of each disaster type. For instance, hurricanes demand different planning than earthquakes or wildfires. Many SLTTs lack access and training to the modeling and simulation tools, which are widely used by FEMA, the National Weather Service, U.S. Geological Survey (USGS), and DOE. FEMA can provide SLTT with access to these tools, along with training and technical assistance. Without a scientific foundation, emergency plans will continue to fall short in preparedness and emergency planning.

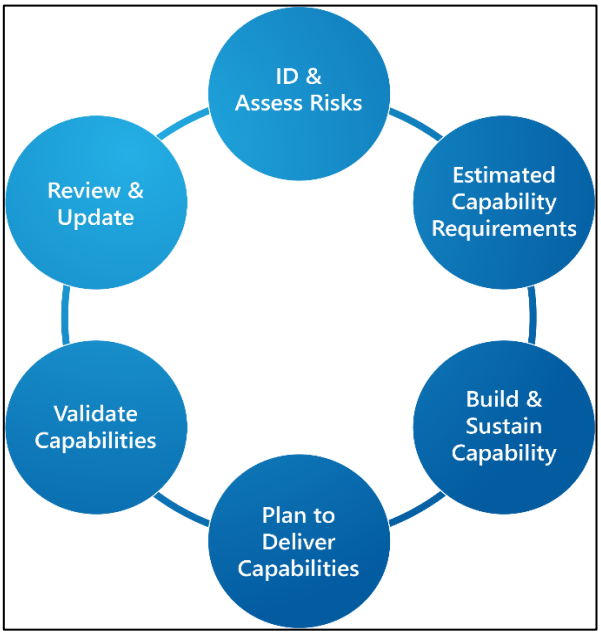

Figure 11. National Preparedness System.

Furthermore, it is vital that FEMA guide the integration of risks that continue to grow in intensity and frequency into THIRA, especially when historical data no longer accurately predicts future risks. FEMA has acknowledged this in recent guidance.

As traditional risks evolve and new threats emerge, there is an urgent need for more precise, hazard-specific, and scenario-based planning. FEMA and CISA should also issue joint guidance on conducting community-scale cyber risk assessments. This will increase the range of hazards, including emerging risks, that are addressed in preparedness planning.

Develop hazard-specific annexes for effective response.

To enhance preparedness and resilience, it is imperative that SLTTs develop hazard-specific annexes for the most important local hazards and capability-specific annexes for the capabilities that have the highest impact on disaster outcomes. These annexes should detail the unique operational requirements and response strategies needed for different types of disasters, ensuring that communities are better equipped to manage and mitigate the impacts of emergencies. This targeted approach allows jurisdictions to move beyond a one-size-fits-all approach to disaster planning and build a more tailored, effective, and life-saving response framework specific to their communities' needs.

Clarify National Preparedness System terminology.

FEMA's doctrine outlines six critical components of the National Preparedness System: risk assessment, capability estimation, capability building and sustaining, planning, validation, and continuous review as depicted in **Figure 11**. The National Preparedness System steps could be more effectively communicated and implemented by using terminology familiar to emergency management practitioners: planning, training, exercises, and AARs. The NIAC recommends FEMA simplify and standardize its approach by highlighting this cycle, ensuring a more practical and consistent application across all levels of emergency management.

Streamline overlapping concepts.

The National Preparedness System currently features overlapping concepts, including ESF, Core Capabilities, Community Lifelines, and Lines of Effort (LOE). While each of these plays a vital role, their overlap can create confusion, diluting the effectiveness of disaster response strategies. The NIAC recommends that FEMA clarify these concepts and their use in disaster response.

4.3.4. FEMA should create a national system for exercises, AARs, and corrective actions.

The NIAC recommends that FEMA, Federal agencies, and SLTT governments create robust and comprehensive exercise programs, tiered to achieve foundational capabilities. Once established, the nation's emergency management network should continue to develop more sophisticated, hazard-specific, or capability-specific activities. Regardless of the level, exercises should not become a stand-in for training. To maximize the effectiveness of emergency exercises, it is crucial that all participants are thoroughly trained in the relevant plans before any exercise begins. Training the plan enhances understanding, promotes alignment among all stakeholders, and ensures that exercises are a true test of capability rather than an introduction to the procedures.

The NIAC recommends that the tiered exercise approach primarily emphasize incident management and resource-sharing capabilities. SLTT agencies should be encouraged to train on using NIMS/ICS and acquiring and employing resources such as IMAT, US&R, EMAC, and mutual aid agreements. Only after training is successfully completed for most of the workforce should exercises be conducted. While the NIAC does not expect FEMA to be able to manage or assist all SLTT governments in conducting these exercises, the NIAC

recommends that FEMA develop detailed guidelines and procedures to ease these incident management exercises.

FEMA should also establish clear guidance on the frequency and prioritization of exercises. A tiered approach that considers the maturity of emergency management capabilities, the risks faced by the community, and past performance in exercises and real events could allocate resources more effectively. This would ensure that communities with less experience or higher risks receive the support they need to build and sustain their preparedness levels.

Furthermore, to improve future response efforts, it is essential to create an environment where response teams feel encouraged to provide honest and constructive feedback, even when it highlights what went wrong. This feedback is critical for identifying gaps, refining plans, and improving overall preparedness. Currently, little to no information is shared after exercises. While the NIAC understands that sharing all information is not likely palatable to many stakeholders, the NIAC recommends that FEMA develop key metrics or outcome measures that all agencies must report – whether Federal, SLTT, or private sector organizations engaging with public actors for response. These metrics may include a percentage of the total current staff that is trained in incident management and the demonstrated ability to manage incidents of specific scale and duration. If these foundational capabilities are properly measured, they will improve.

FEMA's exercise and corrective action programs must receive adequate resources to ensure they are comprehensive and inclusive. States will have to assist Tribes and local jurisdictions with exercises and AARs, which many already do. There is, however, a need to develop a comprehensive approach to building capabilities through planning, training, exercise, and AARs – one tier at a time. These programs should be expanded to include more Federal partners and SLTT agencies, ensuring a whole-of-community approach to preparedness. Expanding participation will foster stronger collaboration and integration, which are vital during actual disaster response operations.

The NIAC recommends a PPD giving FEMA the responsibility and authority to conduct AARs after major presidential declarations that include all stakeholders engaged in disaster response. Currently, no overarching authority or policy is mandating Federal interagency after-action reviews, leaving a critical gap in the continuous improvement process essential for national disaster preparedness and response. This will also help SLTT agencies learn through observation as to their role when they are expected to lead AARs.

These exercises should also include partnerships with the private sector, including industries like tourism, which can play a critical role in preparedness and response efforts. Since most U.S. critical infrastructure is privately owned, it is imperative that the private sector infrastructure owners and operators are included in emergency response and recovery exercises. This partnership works both ways. The annual GridEX exercises conducted by utility companies have not often included FEMA. There is a need for greater coordination before a disaster between infrastructure owners, operators, regulators, and the emergency response community.

FEMA must lead a national-level, interagency, and SLTT government exercise effort that examines emergencies affecting a sizable number of states, such as a National Security Emergency or a multi-state natural disaster like the New Madrid Seismic Zone. These exercises will test the prioritization of resources during events that cause widespread destruction.

Continuous improvement is a cornerstone of effective emergency management. AARs, developed from both exercises and real events, are invaluable for identifying strengths and areas for improvement. FEMA should stress the importance of AARs in its guidance, ensuring that lessons learned are systematically captured,

shared, and acted upon. This continuous learning loop will help refine plans, improve training, and ultimately enhance the resilience of all communities.

By implementing these recommendations, FEMA can strengthen the nation's preparedness posture, ensuring that exercises are more effective, feedback is more actionable, and emergency managers are better equipped to respond to future disasters.

4.4. Lifeline Coordination with the Private Sector for Effective Disaster Response

The NIAC has repeatedly emphasized the need for enhanced coordination between SLTT governments, Federal agencies, and private infrastructure owners, particularly concerning cyber risks. CISA developed frameworks like the NCF to guide this integration. The NCF, a set of 55 functions arranged into four areas (connect, distribute, manage, and supply), lists "Prepare for and Manage Emergencies" as one of the functions, yet the practical application during real-world disasters has fallen short.

Catastrophic events like Hurricane Sandy in 2012 and Hurricane Maria in 2017 starkly demonstrate the devastating impact of inadequate coordination. Hurricane Sandy left 8.5 million people in the Northeast without power, exposing the gaps in collaboration between FEMA and DOE, which led to the establishment of a joint Energy Restoration Task Force. Similarly, the 2017 disasters underscored the critical importance of community lifelines, yet efforts to unify public and private sector response strategies remain fragmented.

The NIAC also conducted three important studies in 2023 that address portions of the critical infrastructure. The NIAC's 2023 *Cross-Sector Collaboration to Protect Critical Infrastructure* report highlighted the systemic issues that plague a wide range of disaster and crisis response (e.g., pandemics, cyberattacks, hurricanes), including a lack of clarity in decision-making, diffused authority within the federalist structure, and the absence of a unified command. These issues are particularly acute when managing interdependencies among lifelines, such as a power outage leading to a loss of water supply and disruption of communication systems. The cascading impacts of these failures can cripple entire regions, yet current national response frameworks do not adequately address these interdependencies.

Moreover, coordination with local businesses, a vital component of community resilience, is often overlooked. FEMA's 2017 Hurricane Season AAR[52] pointed out the lack of doctrine to unify public and private sector efforts toward a national response goal. It also noted that the NRF does not address interdependencies and cascading impacts among lifelines and associated infrastructure sectors.

During the Maui wildfires, this deficiency was evident when large resorts, which could have provided safe shelter for evacuees, were not utilized due to a lack of pre-planned coordination and the absence of corporate authority for local managers to act independently.

To address these critical weaknesses, it is imperative that FEMA and other Federal agencies actively engage in private sector exercises, expand collaborative frameworks like CISA's NCF, and develop a comprehensive doctrine that unifies public and private efforts. Closer planning and coordination with local businesses must be prioritized to ensure that resources are fully leveraged during a crisis. Only through a cohesive,

[52] Federal Emergency Management Agency, U.S. Department of Homeland Security, July 12, 2018. "2017 Hurricane Season FEMA After-Action Report."

integrated approach can the U.S. strengthen its disaster response and safeguard its communities from future catastrophes.

FEMA exercises should include SCC members as well as the SRMAs that have the responsibility for lifelines. It is a maxim of emergency management that coordination should occur prior to any disaster. The inclusion of SCCs and SRMAs in national and regional exercises will provide many opportunities to coordinate actions.

4.4.1. CISA should emphasize NIMS/ICS in national critical functions.

Nearly 80% of U.S. critical infrastructure is owned and/or operated by private companies. Recent disasters underscore the necessity of stabilizing vital lifelines and infrastructure before any effective response or recovery can take place. While FEMA recognized this need by creating *ESF-14: Cross-Sector Business and Infrastructure* as an ESF, the NIAC maintains that a more integrated approach is essential. Creating a separate ESF solely focused on business and infrastructure risks oversimplifying the complexities of essential services like transportation, communication, water, and power.

Concurrently, CISA defined NCFs that encompass activities vital for managing and operating critical infrastructure. However, one activity is directly relevant for emergency managers: "Prepare for and Manage Emergencies." The NIAC recommends that CISA reinforce the use of HSPD-5 and NIMS/ICS as the doctrinal foundation for managing emergencies for all infrastructure owners and operators.

To improve the nation's national emergency response, the NIAC strongly recommends that an Executive Order be issued mandating that FEMA and the Federal agencies overseeing lifeline sectors harmonize their doctrines for emergency planning, training, and exercises.

Currently, NIMS/ICS and FEMA planning doctrines are not consistently applied to private sector owners and operators, creating gaps in our national response framework. A unified response system is crucial, and this can only be achieved if all key stakeholders—Federal agencies, regulatory bodies, and the private sector—operate from a common doctrinal foundation.

4.4.2. CISA and FEMA should promote cross-sector collaboration.

The NIAC's 2023 *Cross-Sector Collaboration to Protect Critical Infrastructure* report recommends forming a convening group across the SCCs to develop cross-sector drills. A major rationale for this is to be prepared for physical or cyber-attacks that affect more than one infrastructure sector – through deliberate attacks or through cascading impacts. It also recommends developing and exercising a common playbook among Federal, state, and private entities. The NIAC now recommends that FEMA lead this effort, in coordination with CISA, and incorporate key doctrinal elements of disaster response, including NIMS and ICS, core capabilities, and incident management.

This need for private owners to collaborate and coordinate with Federal and SLTT entities is also echoed by the NIAC's 2023 *Managing the Infrastructure Challenges of Increasing Electrification* report. It notes the need to include emergency managers in the GridEx exercises and strengthen the standards for information-sharing and coordination. The Electricity Subsector Coordinating Council created a wildfire subcommittee to address issues affecting wildfire and electrical grids. The NIAC recommends that the various SCCs review the need for subcommittees or initiatives to enhance information-sharing and coordination with government emergency managers. These structures can enhance planning, training, exercising, response, and recovery involving major lifelines, as well as address the issue of resiliency of the lifelines.

This alignment would ensure that emergency plans, training programs, and exercises are cohesive and comprehensive, incorporating the expertise and resources of all involved parties. For instance, FEMA and CISA should collaborate to ensure that the NCF framework explicitly recommends using FEMA's doctrine for the "Prepare for and Manage Emergencies" function, thereby creating a more integrated and effective response system, capable of addressing complex emergencies.

4.4.3. FEMA should spearhead advanced modeling tools to assess cascading impacts.

FEMA should spearhead using advanced modeling tools to assess interdependencies and cascading impacts across lifeline sectors. These sophisticated tools, tailored to specific locations and impacting common-cause failure analysis, are essential for understanding how disruptions in one sector can affect others. Insights gained should be shared with SLTT agencies while respecting security protocols, ultimately enhancing national preparedness for catastrophic lifeline failures and national resilience.

4.5. A Systematic and National Approach to Resiliency

4.5.1. FEMA's MitFLG should develop a comprehensive, Disaster Resiliency Strategy for the Federal government.

FEMA's mitigation programs, especially with the creation and increased funding for BRIC, form a great source of mitigation and resilience funding for six systems that impact the health, safety, well-being, and prosperity of our communities. FEMA is also the agency entrusted with leading the MitFLG, which includes participants from other Federal agencies. The NIAC recommends that the MitFLG develop an outcomes-based strategy for disaster mitigation and resilience (both pre- and post-disaster), that incorporates the relevant aspects of the recently issued Resilience Guidelines and identifies and prioritizes where mitigation investments are warranted, how to measure and assess mitigation efforts, what levels of mitigation investments are necessary, and what barriers exist in reaching resilience goals.

The NIAC believes that such a strategy would benefit from some of the other recommendations in this report, including simplifying disaster recovery and mitigation programs, requiring resilient building codes for buildings and lifeline infrastructures in post-disaster recovery, increasing technical assistance to communities, incentivizing public-private investments in critical infrastructure, and encouraging nature-based solutions.

The NIAC recommends that the President consider an Executive Order giving FEMA the responsibility to create a whole-of-nation Disaster Resilience Strategy, which would include tasking other Federal agencies to support this effort.

4.5.2. FEMA and NIST should test and develop the functional recovery framework.

In response to a 2018 Congressional directive in the National Earthquake Hazard Reduction Program reauthorization, NIST and FEMA are developing a functional recovery framework to enhance earthquake resiliency. This framework acknowledges that current building codes prioritize life safety – the most basic level of protection – but often leave infrastructure assets non-functional after a disaster. Functional recovery aims to raise the protection threshold, ensuring critical assets remain operational even when

damaged. For instance, a highway that retains at least one operable lane for traffic after an event exemplifies functional recovery in action.

As stated, FEMA defines resilience as "the ability to prepare for threats and hazards, adapt to changing conditions, and withstand and recover rapidly from adverse conditions and disruptions." The functional recovery framework provides the technical foundation necessary for establishing faster recovery timelines for critical infrastructure. While implementing such standards may incur higher upfront costs, extending the lifespan of infrastructure could ultimately reduce overall expenses (and aid in faster recovery as depicted in **Figure 12**). Notably, most infrastructure costs (70 to 85%) stem from operations and maintenance over time rather than the cost of initial design and construction (15 to 30%).

NIST and FEMA are expanding the functional recovery framework to address additional hazards, including flooding, and are studying the impacts of overlapping risks like earthquakes and landslides.

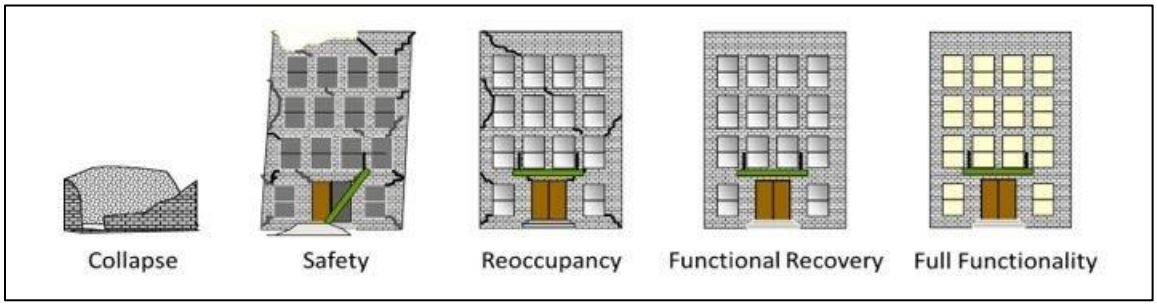

Figure 12. Theoretical Range of Building Performance and Relative Placement of Safety-based and Recovery-based Goals (original from R. Hamburger)

The NIAC recommends that SLTT governments develop a Recovery Plan every three to five years. This plan should create an asset inventory to identify critical infrastructure assets essential for response and recovery operations and establish a Recovery Time Objective (e.g., hours, days, weeks) for restoring functionality as shown in **Figure 13**. Key sectors to focus on, as recommended by FEMA and NIST, include power, water, liquid fuel and natural gas, transportation, and communications.

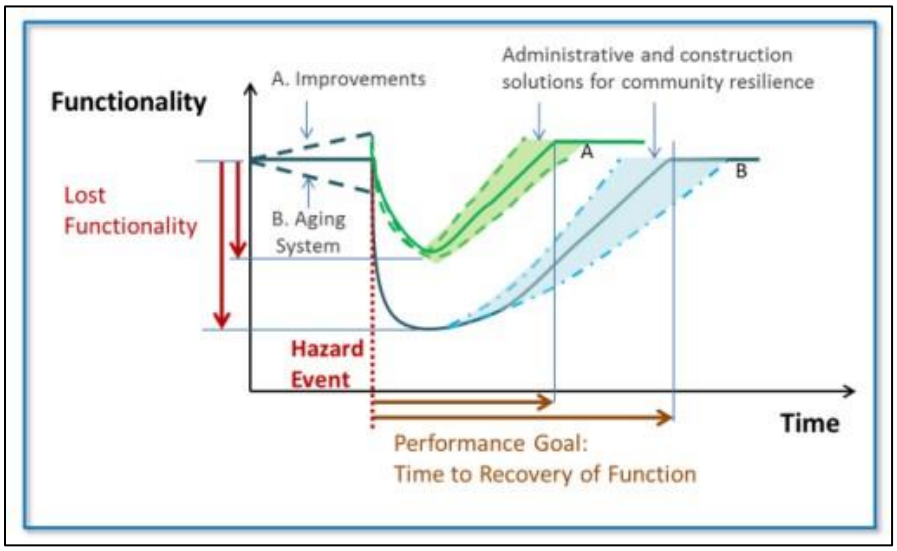

Figure 13. Resilience Concept of Functionality Versus Recovery Time for the Performance of the Built Environment During a Disruptive Event (Source: McAllister 2013)[53]

Furthermore, the NIAC urges NIST and FEMA to continue developing the functional recovery framework for various hazards and implementation guides for the framework's use. Creating robust business cases for private investments in resiliency is also key and could be used to convince investors, regulators, financiers, and insurers of the value of investing in functional recovery. These business cases should account for not only physical losses but also business interruptions, as the latter often exceeds the former. NIBS research on mitigation indicates that there is a 1:3 benefit-to-cost ratio for seismic mitigation projects, while NIST and FEMA calculate that using functional recovery concepts could yield a 9:1 ratio – three times as much.

Finally, the NIAC recommends that FEMA allow PA grantees opting for the 428 model to rebuild based on functional recovery standards. As this framework is still being tested, utilizing grant programs would serve as a pilot initiative to assess its viability and effectiveness. By adopting this forward-thinking approach, the U.S can enhance national resilience and ensure a more effective recovery from future disasters.

4.5.3. FEMA and NIST should task standard-development bodies to develop resilient codes and standards for critical infrastructure.

The ASCE has developed codes and standards for water systems, electric power, and transportation systems. The NIAC recommends that FEMA and NIST task the ASCE to refine these codes, including, at a minimum, climate change impacts and performance-based criteria for systems rather than components.

4.5.4. HUD and FEMA should require resilient housing under grant-funded programs.

The Biden-Harris Administration's "National Initiative to Advance Building Codes" is focused on increasing resiliency while also making structures more energy efficient. As noted in the press release, every dollar invested in building code adoption provides eleven times more in savings by reducing damage and helping communities recover more quickly.[54] This National Initiative specifically mentions HUD and using CDBG

[53] NIST. Technical Note 2209, 2022, p. 1-6.
[54] National Institute of Building Sciences, Multi-hazard Mitigation Council, 2019. Natural Hazard Mitigation Saves.

funds for disaster recovery. The NIAC recommends that Federal agencies funding housing recovery agree to the building standards that grantees can choose from as their standard for their community's recovery.

In line with the National Initiative, the NIAC recommends that HUD, which has the primary mission for long-term housing recovery, raise the standard from providing "decent, safe, and sanitary" housing to providing resilient housing. Since HUD funding primarily assists low- and moderate-income households, a change of this nature could upgrade the most vulnerable structures for the most vulnerable populations. There is recent precedence as the Fair Housing Act was amended in 2020 to adopt the new ICC standards, and in 2021, HUD adopted the International Energy Conservation Code and American Society of Heating, Refrigerating and Air-Conditioning Engineers 90.1-2019 for energy resiliency for homes.

The NIAC understands that such a resiliency mindset will require a cultural and political shift from the speed of recovery to a better and stronger recovery. This may contradict the findings and recommendations in other parts of this report that emphasize speed. However, nation desires more than speed in recoveries; the U.S. must strive to create a more resilient nation. Too many recoveries are focused on replacing the most vulnerable of housing types, mobile homes, with mobile homes rather than upgrading the housing stock.

The U.S. currently uses standards that are meant to only protect occupant life; they do not provide resiliency.

4.5.5. Government-supported enterprises should incentivize resilient housing.

Fannie Mae and Freddie Mac are government-sponsored enterprises (GSE) that provide a backstop for residential home mortgages. Their combined total asset value is over $7.5 trillion. In 2023, the two GSEs purchased 1.76 million single-family home mortgages.

The NIAC recommends that the Federal Housing Finance Agency (FHFA) consider mitigation and resiliency incentives for single-family mortgages as part of the GSEs portfolio and add all-hazard risk disclosure for real estate transactions.[55] These changes would be meaningful as the two GSEs could impact resilient housing more than any changes to the disaster recovery system. In addition, the NIAC recommends that the FHFA require the GSEs to mandate flood insurance for all properties in its portfolio, not just the properties that are in the SFHA.

4.5.6. Revise the tax code to allow deductions for mitigation investments.

The NIAC recommends that Congress and the Administration consider changes to the tax code to allow deducting the cost of mitigation measures from total taxable income. Tax code changes are powerful levers to move the needle toward more resilient housing. There is currently a bill in Congress to consider such a change.[56]

[55] Wildland Fire Mitigation and Management Commission, September 2023. "On Fire: The Report of the Wildland Fire Mitigation and Management Commission."
[56] Congressional Research Service. 2023. "H.R.4070 - 118th Congress (2023-2024): Disaster Mitigation and Tax Parity Act of 2023." Congress.gov. 2023.

4.5.7. Federal agencies should incentivize risk reduction through repetitive loss mitigation and property buyouts.

Most FEMA-funded buyout programs have resulted in just one to three properties being bought.[57] The NIAC recommends that FEMA review buyout data and develop a strategy to assist with a more wholesale acquisition of properties, especially in communities that are in high-risk areas and have suffered repeated flooding.

FEMA and HUD should develop joint guidelines for buyout programs so that SLTT entities can best leverage both funding sources.

4.5.8. FEMA should increase options for temporary housing.

The NIAC recommends that FEMA expand the options available for temporary housing. FEMA may need to create more pilot programs to experiment with how to provide temporary housing rapidly and cost-effectively, including allowing states to manage temporary housing programs. The STEP program, although it proved to be expensive in Puerto Rico and Texas, may need to be put back in the toolbox, with constraints on costs and time management. Also, Direct Repair, a FEMA program that has been previously out of favor, should return as an option.

4.5.9. The Federal government should empower homeowners, renters, and landlords to become resilient.

The NIAC recommends that FEMA, HUD, DOI, and USGS collaborate to create information resources and outreach materials to educate and motivate homeowners and landlords to make housing more resilient. A good best practice example is promoting the idea of recycling, creating positive associations with recycling, and helping consumers understand how to recycle.

4.5.10. Federal agencies and stakeholders should assess and invest in Nature-Based Solutions.

Experimentation and data collection are needed to test the concepts of nature-based solutions. The NIAC recommends that FEMA and the USACE work with other stakeholders, such as the ASCE and states, to implement pilot solutions, collect data, and evaluate the resiliency and economic benefits of NBSs. The effects of these solutions will not likely be evident for a few years. However, NBSs hold the promise of being a very good tool in the resiliency toolset and may meaningfully reduce the costs of achieving a balance with nature.

The NIAC recommends that ASCE, USACE, and states advance NBSs for infrastructure and collect evidence on their effects on various phenomena, including disaster damages, ecosystem effects, etc. Nature-positive solutions hold tremendous potential; however, they require innovative research and rigorous data collection before public and private funding organizations can objectively calculate the costs and benefits of such projects.

The NIAC recommends that FEMA review the BRIC program and BCA processes to ensure that NBSs are scored appropriately. In their next update of the National Resilience Guidance, it would be useful if FEMA

[57] Mach, K.J et al. "Managed retreat through voluntary buyouts of flood-prone properties." Science Advances vol 5, no. 10 (2019):1-9.

could connect the dots from traditional hazard mitigation project formulation to envisioning and applying for resilient projects, including for NBSs.

Developing such solutions will require long-term planning and innovative design. Several of previously stated recommendations also point to the value of long-term recovery and resiliency planning (see recommendations on pre-disaster recovery planning and functional recovery). The U.S. must move from reactive disaster recovery to more thoughtful, long-term resiliency planning.

Many states and cities are appointing a Chief Resiliency Officer. The NIAC recommends that Chief Resiliency Officers collaborate with infrastructure agencies, disaster recovery organizations, and others to develop long-term strategies to explore how nature-positive infrastructure and solutions can be implemented in pre- and post-disaster contexts. NBSs may require collaboration with non-traditional partners, including conservation and environmental groups and academia. FEMA Resiliency Guidelines and the ASCE Policy Statement 575 on Nature-Based Solutions are resources to guide such planning.

4.5.11. The Federal government should encourage public and private initiatives for resilient infrastructure.

Briefers to the Subcommittee noted that Federal disaster programs are aiding SLTT governments in starting resiliency initiatives, such as the following:

- FEMA's STORM program provides seed money and revolving loan funds to help start resiliency efforts.
- CDBG-MIT funding in Texas is an integral part of Harris County's resilience programming.
- BRIC grants are valuable, but unpredictable funding timelines leave SLTT governments struggling to plan effectively.

Federal agencies could do more, such as the following recommendations:

- Provide access to threat and risk data and modeling tools. Good data is needed at the watershed level to perform vulnerability studies that form the basis of science-informed decisions on resiliency programs. Many Federal agencies, such as USACE, FEMA, USGS, NOAA, EPA, the National Aeronautics and Space Administration, etc., collect and generate data and conduct watershed modeling.
- Provide additional technical assistance and training to increase SLTT capacity and expertise.
- Make Federal programs more flexible. This is one of the most important things agencies could do. Transformational initiatives do not fit into defined cookie-cutter programs and generally require funding from many sources. If Federal programs are less prescriptive, it is easier to merge or braid funds from many programs and agencies—and even the private sector—to make significant headway on resiliency.

The NIAC urges the Federal government to lead a comprehensive study to increase private sector investment in resilient infrastructure. This study would explore how strategic P3s, innovative long-term maintenance concessions, and fully private infrastructure projects could accelerate resilience nationwide. By examining successful P3 frameworks in countries like Canada and Australia, the study could reveal effective strategies to integrate resilience metrics into joint contracts, ensuring infrastructure investments are built to endure. Including insights from Chief Resiliency Officers, disaster recovery experts, and initiatives like NBSs, this study could identify the best organizational structures—such as dedicated P3 offices—that empower

states to foster and manage these transformative partnerships. This effort would lay the groundwork for a resilient future, bolstered by private sector commitment.

4.6. Survivor Services

4.6.1. Federal agencies should integrate survivor services.

The NIAC recommends that Federal agencies providing survivor services coordinate and streamline the process and develop a universal disaster application. This should include, at a minimum, FEMA, HUD, SBA, and HHS. This may require agencies to standardize their disaster assistance requirements. If benefits are predicated on home inspections, the NIAC recommends that Federal agencies agree to a single inspection and rely more on data and technology to gather relevant information, supplemented with ground-truth physical inspections.

Several briefers mentioned the Disaster Survivor Fairness Act of 2023. This Act would offer a critical opportunity to streamline and enhance support for disaster survivors. This legislation simplifies seeking assistance after a major disaster, like this recommendation.

The NIAC recommends that FEMA develop an IA Operational Guide for SLTT partners. The Guide should clarify what happens when an IA declaration is approved and outline the roles that the SLTT partners may be asked to play.

The NIAC also recommends that oversight agencies such as GAO and DHS OIG set up a threshold for fraud, waste, and abuse. The American public consistently criticizes Federal agencies for delays in delivering aid, yet hold them to unforgiving standards, scrutinizing even minor missteps.

4.6.2. States should address access and functional needs.

The NIAC recommends that states review the Access and Functional Needs framework developed by the State of California and adopt it to the degree it suits their needs and requirements. Deliberate effort should be made to make emergency management more inclusive and include individuals with access and functional needs throughout the planning and development process. Emergency plans at local levels should incorporate how people with access and functional needs will be assisted. This may require legislative changes at the state levels, as was necessary in California. In addition, it would be beneficial for states to develop training on planning for access and functional needs and providing it to its local jurisdictions. The focus of these plans and training should include communications, sheltering, and evacuation, at a minimum.

4.6.3. Local emergency managers should inform and assist citizen preparedness.

Citizen preparedness is a local responsibility and is closely tied to trust in local government.[58] Local governments also have the data on specific hazards and alert and warning systems, and they will be the authorities calling for evacuation, shelter-in-place, or other protective actions. They also need to provide information on resiliency measures that citizens should consider. These activities can be performed as a part of the Community Emergency Response Team.

[58] Choi, J. and Wehde, W. "Trust in Emergency Management Authorities and Individual Emergency Preparedness for Tornadoes." *Risk, Hazards &Crisis in Public Policy* vol 11 (2020):12-34.

4.6.4. FEMA should study how to more adequately address the needs of Tribal nations.

The NIAC recommends FEMA study how to better assist and sustain Tribal nations with their disaster management and resiliency needs. This study should include a review of whether tribes should directly receive EMPG funding. The study should also review how to provide greater technical assistance to tribes to apply for pre- and post-disaster grants and programs.

4.7. Insurance Accessibility and Affordability

Insurance is a vital risk transfer mechanism, especially as disasters and associated losses continue to rise. Insurance pricing reflects risk. Risks of wildfire, floods, storms, and other perils have been rising, and insurance premiums have been rising or insurance companies are leaving areas they perceive to be at higher risk. If insurance becomes increasingly inaccessible or unaffordable for the major perils facing American communities, the burden will inevitably shift completely to the USDT to compensate citizens for their losses after disasters. It is instructive to remember that the NFIP was created in 1968 because the private U.S. flood insurance market collapsed.

While multiple states face a severe crisis in insurance availability and affordability, the root causes vary widely. In some states, private insurers have pulled out, shifting the insurance burden onto state-run "insurers of last resort," straining public resources. In other states, tort reform may be necessary to address the overwhelming volume of lawsuits against insurers. Yet, in other states, regulatory mandates requiring insurers to continue high-risk policies have driven companies to exit the market. Given that insurance is regulated at the state level, the NIAC urges the Federal government to work with states and state regulators to assess their unique market conditions and intervene with policies that ensure the long-term sustainability of insurance for residents and businesses.

Recognizing the need for consistency nationwide, the USDT established the Federal Insurance Office (FIO) in 2021. With 56 different regulatory regimes across states, territories, and the District of Columbia, the FIO can play a crucial role in fostering greater stability and uniformity across the insurance market, benefiting insurers and policyholders nationwide.

4.7.1. The Federal government should encourage all homeowners to purchase flood insurance.

A risk management pool cannot be structurally sound without a balanced mix of high-risk and low-risk participants. Similarly, the misconception persists that flood insurance is solely for residents in FEMA-designated floodplains. However, unprecedented flooding occurred outside these official boundaries, as evidenced by recent disasters.

For instance, during the 2016 floods in Southern Louisiana, approximately 75% of affected properties were not within the SFHA. In 2017, around 40-50% of flooded homes were outside of a SFHA. In 2018, Hurricane Florence caused flooding in North Carolina, impacting 40 to 50% of homes that were not in designated flood zones. Even more recently, Hurricane Helene inundated areas in the mountains of Western North Carolina outside of flood zones, underscoring the unpredictability of flood risk.

To create a more fiscally sound NFIP, the costs of flood insurance must be spread nationwide. Homeowners in lower-risk areas who purchase flood insurance at more affordable rates—reflective of their location—will

see their disaster losses significantly covered, with estimates indicating coverage at 85% versus just 20% for those without insurance. By embracing the need for comprehensive flood insurance across all areas, the U.S. can build a stronger, more resilient future for every community.

4.8. Use of Data and Technology

4.8.1. FEMA should accelerate the use of data and technology.

To enhance disaster preparedness and response capabilities, FEMA should prioritize the rapid integration of advanced data and technology solutions. The NIAC recommends that FEMA establish a competitive grant program to encourage the development and deployment of innovative methods in data analytics, geospatial technologies, AI, and machine learning. These technologies significantly improve the accuracy of risk assessments, optimize resource allocation, and enhance situational awareness during disaster response operations.

The grant program should target public and private sector entities, including startups, research institutions, and SLTT agencies, to foster collaboration and innovation. Priority should be given to projects that demonstrate the potential to scale nationally and address critical gaps in current emergency management practices, such as real-time damage assessment, predictive modeling for resource needs, and the integration of social media analytics for public information and warning.

Additionally, FEMA should provide technical assistance and establish partnerships with technology companies to ensure grantees successfully implement and sustain these innovations. This approach will drive technological advancement in emergency management and create a more resilient and responsive national preparedness system. By accelerating the use of cutting-edge data and technology, FEMA could lead the way in transforming disaster response and recovery efforts, ultimately reducing the impact of disasters on communities across the country.

Public Law 115-307 (2018) directs the USGS as the lead agency to investigate and collect data after significant domestic and international earthquakes. Such investigations and data gathering should also be conducted after major presidential disaster declarations. Our ability to use advanced computational models in disaster management is predicated on a comprehensive and multi-faceted data collection effort. Private infrastructure owners and operators increasingly use digital twinning and simulation models to understand how infrastructure behaves under various stressors. Public infrastructure owners would be wise to start managing their infrastructure assets using such tools and technologies to find easily accomplished changes that decrease disaster damages and/or increase the lifespan of various assets.

During exercises, the strategic use of modeling and simulations can significantly enhance the realism and effectiveness of training. However, resource constraints often force a choice between fewer, more resource-intensive exercises focused on a small community and more frequent exercises with broader reach but reduced capability. FEMA should provide clear guidance on balancing these factors, possibly through a maturity model that prioritizes exercises based on the unique needs and capabilities of the participating communities.

There are many opportunities to better assist survivors using technology. Multiple agencies perform housing inspections using conventional techniques. This requires large mobilization of inspectors to disaster sites. A single home may be inspected multiple times for multiple agencies. FEMA and other Federal agencies should consolidate requirements and use tools such as drones, imagery, and databases to collapse the time

required to perform these assessments and get funds to survivors faster. FEMA should experiment with the use of technology for damage assessments, which is another area causing delays in the recovery process.

5. Exemplary Practices

During the Reimagining Disaster Response and Resiliency Subcommittee briefings, a variety of practices stood out as innovative and effective. While the following list is not exhaustive, the NIAC selected a few key practices to highlight as valuable for FEMA and emergency managers to consider. These examples represent strategic or forward-thinking approaches that serve as a model to enhance preparedness, response, and resilience across the nation.

5.1. FEMA Urban Search and Rescue Response System

When a disaster strikes, the most urgent and immediate required task is to save lives. The 28 FEMA Search and Rescue teams do exactly that, and they do it well. They find and rescue survivors and recover human remains. Created in 1989, the US&R teams have rescued countless survivors and brought closure to many families for a continuum of diverse disasters ranging from the September 11, 2001, attacks, to Hurricane Katrina, the Surfside condominium collapse, the 2010 Haiti earthquake, and more recently, the Maui wildfires, the Baltimore Francis Scott Key Bridge collapse, and Hurricane Helene. US&R task forces are designed to deploy within six hours in various response models and arrive at the disaster site with all their equipment within 16 hours of mobilization. US&R task forces are an important component of the national response system. The 28 teams have about 6,000 members comprised of police officers, firefighters, engineers, doctors, and other volunteers. Just like other disaster resources, US&R has seen rising deployments since 2012.

US&R task forces are composed of Federal, state, and local partners. Each task force has a state or local sponsor such as an emergency management agency or fire department, etc. The sponsoring agencies receive training and equipment, which can be used for local US&R incidents in their routine operations. States and local partners are partially funding US&R task forces, with FEMA providing funding from both agency general budgets as well as the DRF.

Why is the US&R response system so successful? US&R has almost the entire virtuous cycle of preparedness covered: processes for planning, training, exercises, and AAR/continuous improvement. It also covers the elements of capacity and capability building through doctrine, organization, training, equipment, leadership, personnel, and facilities. As early as 2016, GAO lauded US&R's leading management practices, and US&R is still continually evolving and improving practices to which others emulate to this date. The following list contains US&R practices, which have evolved over time:

1. **Strategic Planning** – FEMA has a Strategic Plan for US&R, including three strategic goals with eight supporting key objectives. US&R leaders develop specific objectives, nested within, and required to, achieve the three strategic goals. Those objectives are:
    - Enhance and sustain current National US&R Response System resources and response capability.
    - Ensure a full-system approach to timely, accurate, and transparent communications.
    - Account for the increasing needs of system members' behavioral health and wellness.
    - Identify, utilize, and leverage technology to identify and forecast changes in the US&R response and capability models.
    - Ensure the system is prepared to respond to an increasingly complex disaster environment.
    - Institutionalize a robust and validated US&R professional development and leadership program.

- Use data-driven decision-making to align the goals, strategies, and objectives with the US&R mission.
- Ensure continued coordination and enhance stakeholder partnerships through collaborative education, training, and exercises.
- Each task force must meet the same training standards for the same position. This standardization of skills and training allows personnel to supplement other task forces, if necessary.

2. **Exercises** – FEMA uses a variety of means to test preparedness, such as administrative readiness evaluations and the Operational Readiness Exercise Evaluation Program. Administrative readiness evaluations include annual self-assessments and a triennial peer review. Task forces are graded as operational, conditional, or non-operational. If a task force is deemed to be less than operational, it must develop a corrective action plan. The Operational Readiness Exercise Evaluation Program conducts a large-scale training exercise triennially and are graded as fully complete, partially complete, or not complete for applicable search and rescue tasks.
3. **AAR/Corrective Action** – All US&R deployments end with an AAR. AARs follow a standard format. Aside from the AARs, there is a US&R Advisory Organization, which is composed of members from all the task forces. Individual task forces can elevate an issue to the Advisory Organization who will study it and propose solutions. The Advisory Organization keeps an Action Tracker List of priority issues.
4. **Doctrine** – FEMA has an US&R Operations Manual (2020) that spells out policies, procedures, and guidance used by all task forces. US&R also implements a standard Rescue Operations Guide. The standard operating procedures are updated after deployments.
5. **Organization** – Each type of US&R team has a standard organizational structure.
6. **Equipment** – Each US&R task force has a cache of over 2,000 types of standardized equipment that it maintains and transports to a disaster site, including communications, hazardous materials management (HAZMAT), logistics, medical, rescue, technical, and water. The standardization of equipment and personnel across the US&R task force architecture enables unique interoperable capability.
7. **Leadership** – FEMA leads through the US&R program's Strategic Group. FEMA also provides technical assistance to US&R task forces.
8. **Personnel** – The US&R Operations Manual lays out each position on the task force and the roles and responsibilities of those respective personnel. Each task force has explicitly defined positions and strives to build the manpower capability three-deep for each defined position.
9. **Facilities** – US&R teams are attached to state or local sponsoring agencies.

US&R task forces are a bargain. FEMA has a readiness cooperative agreement with each task force and respective sponsoring agency. The annual funding comes from the FEMA budget, and costs for deployment are paid through the DRF. Annual funding for US&R system has been static since fiscal year 2020 at approximately $38 million total (or approximately $1.3 million per task force). Sponsoring agencies are absorbing between $800,000 and $1.5 million in costs for the teams, mostly using funds from the State Homeland Security Grant Program and the Urban Area Security Initiative grants. Lack of funding is affecting the replacement of equipment, reducing exercises and operational readiness evaluations, and limiting the use of new technologies, such as drones and geographic information systems). FEMA had estimated that if

the US&R task forces were all Federally manned and funded it would cost $22.7 million per task force almost ten years ago.[59]

5.2. EMAC

The EMAC is a nationwide mutual aid system to share resources in response to disasters. EMAC originated in Hurricane Andrew (1992) and was codified into legislation in 1996 (Public Law 104-321). EMAC has grown to cover all 50 states, territories, and the District of Columbia. EMAC is administered by the NEMA. EMAC is a "pull" system – states that need help seek assistance from other states through EMAC once a State of Emergency is declared by the Governor. When state resources are overwhelmed, other states, including National Guard units nationwide, can fill shortfalls in personnel, equipment, and commodities. EMAC aids with damage assessment, recovery, public health, logistics, security, communications, firefighting, search and rescue, aviation support, community outreach, debris removal, and biological and HAZMAT response.

States that provide resources negotiate costs with receiving states using the EMAC network. The receiving state pays the costs for providing such support, and if there is a presidentially declared disaster declaration, EMAC costs are allowable under the Stafford Act.

EMAC has many benefits, including:

1. EMAC enables requesting and providing jurisdictions to negotiate directly, potentially contracting the request to accommodate availability and simplifying reimbursement.
2. It is an efficient way to share resources between the states and offers:
    - tort liability protection, meaning personnel become agents of the receiving state the minute they are deployed;
    - licensure reciprocity; and
    - workers compensation.
3. EMAC enables the utilization of private sector assets and personnel.
4. EMAC coordinates with FEMA, ensuring that state teams do not overlap FEMA response assets.
5. Importantly, EMAC reduces reliance on FEMA resources and leverages a "neighbor helping neighbor" philosophy. It also allows emergency management personnel to gain valuable experience that will improve their ability to support their home jurisdiction.

While EMAC has proven to be an invaluable tool for resource-sharing among states, it faces several key challenges. Some states report that EMAC deployments are often shorter than needed, limiting the sustained support required by the receiving states. Additionally, emergency managers frequently face the hurdle of persuading elected officials to authorize the sharing of critical resources, and reimbursement timelines can be longer than preferred, placing a financial strain on the states providing aid.

Despite these challenges, EMAC remains a trusted and effective framework for interstate cooperation, enabling states to lend vital support to one another in times of crisis. EMAC has even been leveraged for collaboration between FEMA and the states, such as in 2017, when it facilitated the deployment of additional personnel to assist FEMA's response efforts.

[59] U.S. Government Accountability Office, May 2016. FEMA Needs to Assess Its Effectiveness in Implementing the National Disaster Recovery Framework. GAO-16-476.

5.3. AI-Based Wildfire Alert System

The wildfire crisis in the U.S. is urgent, severe, and far reaching.[60] Wildfires have caused intolerable loss of life, burning hundreds of thousands of acres, thousands of homes, and causing billions of dollars in Federal, state, and local expenditures for fire suppression. Insurers have paid out over $50 billon for wildfire losses between 2017 and 2022. There is an increasing trajectory of larger and more intense fires – not necessarily more frequent, but more severe.

Wildfires spread quickly and are spreading faster. Recent research analyzed 60,000 fires in the contiguous U.S. for the first two decades of the 21st century.[61] Specifically, the researchers looked at fast fires, which accounted for only 2.5% of all fires but were responsible for almost 90% of all fire-associated damages and 88% of all homes. Between 2001 and 2020, these fast fires increased 250% in the western U.S. Some of these fires can grow from ignition to 21,000 acres in a single day.

CAL FIRE teamed up with UCSD to test a new technology that uses cameras and AI to provide an early alert – through a program called ALERTCalifornia.

After a 90-day pilot this capability was rolled out to all 21 CAL FIRE dispatch centers in 2023, UCSD's ALERTCalifornia program started installing and collecting wildfire data from cameras placed in the mountains more than 20 years ago with a National Science Foundation grant. These cameras were supplemented with cameras provided by CAL FIRE, totaling over 1,000 cameras. Cameras can scan 60 miles on a clear day and up to 120 miles on a clear night.

The ALERTCalifornia system has detected potential fires 40% of the time before any 911 calls, and 68% of the time simultaneously with or earlier than the 911 call, over a three-month period. It is helping CAL FIRE meet its performance goal of suppressing 95% of all wildfires before they spread to ten acres or less. After each incident, CAL FIRE personnel provide feedback, which is used to further train and improve the AI system.

CAL FIRE has invested more than $20 million in the ALERTCalifornia program over four years. The value in lives saved and damages and response costs averted is immeasurable.

[60] Wildland Fire Mitigation and Management Commission, September 2023. "On Fire: The Report of the Wildland Fire Mitigation and Management Commission."
[61] Jennifer K Balch et al., "The Fastest-Growing and Most Destructive Fires in the US (2001 to 2020)," *Science* 386, no. 6720 (October 24, 2024): 425–31.

6. Call to Action

The Reimagining Disaster Response and Resiliency Subcommittee heard from nearly 50 experts from across the country on aspects of disaster response, hazard mitigation, recovery, and resiliency. The NIAC's top recommendations below represent essential steps to strengthening our nation's preparedness and response capabilities and increasing resiliency to disasters.

6.1. Align FEMA's Mission with Funding Levels

FEMA is being asked to do too much – much of it outside its traditional role, such as West Nile and COVID-19. FEMA is being activated for about one major disaster declaration every three to four days while simultaneously managing hundreds of older open disasters. This pace is taking its toll both in funding and workforce. FEMA's DRF, which enables FEMA to help people and communities after a disaster, has frequently run on fumes. FEMA's staffing for some emergency cadres dipped below 25% of the strength needed in 2017; in October and November 2024, some cadre staffing dropped below 5%. FEMA personnel are burnt out from constant deployments, and the agency has challenges recruiting and retaining staff. The current situation is unsustainable. FEMA is not able to successfully carry out all the duties expected of it given current funding levels. Either additional funding should be provided, or its mission set should be refined.

6.2. Engage Americans in Disaster Readiness by Providing Better Awareness of Future Hazards and Arming Americans with the Ability to Prepare for and Insure against Disasters

Many briefers to the Subcommittee mentioned that FEMA has become the "insurer of last resort." That is, households and communities are relying on FEMA assistance to make them whole after a disaster. But, at best, FEMA assistance is a helping hand, and for a limited time. A homeowner impacted by a disaster gets an average of $5,000 from FEMA – not enough to pay for most disaster losses. The SBA provides loans that must be paid back.

Decades of experience show that people and communities fare better after a disaster if they have insurance. However, insurance for wildfires, earthquakes, flood, and other perils is increasingly unavailable or unaffordable. Insurance and reinsurance companies are dropping policies and departing various regions as the number and severity of disasters increase. The Federal government should work with state governments to improve the insurance market. States are key as, aside from NFIP, insurance is regulated at the state level.

The NIAC recommends the following actions:

- A nationwide public service campaign is essential to educate people that FEMA cannot fully restore their losses after a disaster and to clarify FEMA's role in recovery.
- Federal agencies that provide immediate disaster assistance should create a single, simple to use system to assist disaster survivors.
- The Federal government should work with state governments to improve the insurance market. States are key, as, aside from the NFIP, hazard insurance is state regulated.
- FEMA and the NFIP should encourage all homeowners, landlords, and infrastructure owners to buy flood insurance. An insurance pool cannot remain viable if it only includes those most likely to file

claims. Doing so would reduce the amount of money that Congress needs to allocate to bail out the program every few years. Currently, the NFIP has a $20.5 billion debt to the USDT. Attempts to make the NFIP actuarily sound have coastal homeowners reeling at the higher costs.

- The GSEs Fannie Mae and Freddie Mac manage a total housing asset portfolio over $7.5 trillion. GSEs should require all properties in their portfolio purchase flood insurance. Currently flood insurance is required only if the property is in the floodplain. This change can potentially dramatically increase the risk pool and make the program economically sustainable.

6.3. Share Accountability and Responsibility for Disaster Response and Resiliency

All the major players in disaster response must increase capability. The NIAC recommends the following actions:

- The Federal government should raise the disaster threshold. This will place a greater responsibility for disaster response and resiliency on states. Before raising the disaster threshold, the Federal government should review previous studies and attempts to address it. In addition, the review should consider that a catastrophic event in a rural area may fall below the new threshold and potentially not receive Federal aid. The review should also consider if the disaster threshold should be a sliding scale. The NIAC notes that the President has discretion under the Stafford Act to declare a Presidential disaster and thereby release Federal funding, whether the disaster threshold is met or not.
- Federal agencies other than FEMA should be proficient in incident management, so that this burden does not always fall on FEMA when a national crises or emergency (e.g., COVID-19) occurs. To accomplish this, the NIAC recommends that Homeland Security Directive-5 and PPD-44 be reissued to emphasize the practices that have made FEMA a pre-eminent disaster response agency, i.e., NIMS and ICS.
- SLTT governments must receive more Federal funding to enhance preparedness. EMPG is the basic funding block for local emergency management. However, EMPG has not kept pace with inflation for the last 12 years. The NIAC recommends that EMPG funding be raised and that performance requirements are tied to funding.

Disaster preparedness and response may become national security concern. Cyberattacks, especially attacks on infrastructure, are rising. If there is a National Security Emergency where there are multiple, simultaneous attacks on the U.S. infrastructure, the DOD will be fully engaged, perhaps overseas, in its core mission of national defense. FEMA and states may have to rely on their own capacity to handle the response and recovery. As DOD has provided almost 50% of staffing for some catastrophic incidents, raising the national capacity to handle large disasters can be a deterrence to our enemies.

6.4. Build a Better, More Resilient America

Most American infrastructure is 50-100 years old or older and has been awarded a low grade by the ASCE. By some estimates, there is a shortage of three to seven million homes nationwide. In the next several decades, America will require an investment of billions and perhaps trillions of dollars to build new roads, energy grids, water systems, housing, and other infrastructure.

The NIAC recommends that instituting the following policies to build a 21st-century, better and more resilient America that also reduces the burden of paying for disaster losses:

- The Federal government must reinforce the importance of building codes. Current building codes are designed for life safety and do not protect against major economic losses. The NIAC recommends that the NIST and standards bodies such as the ASCE define resilient building codes for each critical infrastructure. Standards (such as ASCE 73) take a long time to become codes and then be adopted by SLTT governments, and the NIAC recommends that the Federal government assist in expediting this transition.
- The NIAC recommends that the Federal government consider a tax deduction for homeowners and landlords that upgrade housing to meet resiliency codes. Every dollar invested in mitigation reduces future damages by $6.
- The NIAC recommends that the Federal government make disaster programs more streamlined and flexible. The NIAC recommends that FEMA's premier disaster recovery program, PA, be turned into a block grant. The NIAC recommends that the HUD's CDBG-DR be made a standing program so there are no delays in starting long-term recovery after disasters. Aside from reducing the complexity and delays associated with the current system, these two actions will allow SLTT governments to combine Federal funds more easily with their own funds and private sector funding to mount resiliency initiatives.
- The NIAC recommends that the Federal government review ways to encourage P3s in infrastructure development. The Subcommittee heard from a group representing 110 of the leading global infrastructure investors, amounting to a combined worth of $2 trillion in infrastructure investments across 68 different countries. The U.S. consistently ranks as the best place to invest in private infrastructure investment; however, our patchwork of P3 regulations makes such projects difficult to implement.

6.5. Enhance Disaster Response and Resiliency Through the Use of Data and Technology

Disaster response and resiliency programs are slow in adopting new technologies. The Subcommittee heard about an exception that shows the value of using new technologies. Massive wildfires have taken lives, destroyed housing and infrastructure, and burnt hundreds of thousands of acres. Leveraging a 20-year camera dataset from the wildlands, one jurisdiction is using AI to rapidly locate and control small fires, preventing them from growing The Federal government should encourage and facilitate data collection and the use of modern technology – such as tracking wind or water impacts on disaster, delivering effective public warning for fast-breaking events, and managing infrastructure with asset management technologies such as digital twinning.

Furthermore, the Reimagining Disaster Response and Resiliency Subcommittee is not the only entity focusing on changes to the disaster response and resiliency system. Numerous legislative efforts across the 117th and 118th Congress underscore the need to reform disaster assistance, disaster recovery, and resiliency. There are currently eight active bills in the 118th Congress, many sponsored by legislators from states that have suffered many recent disasters, including Florida, Louisiana, Oklahoma, Mississippi, Kentucky, and North Carolina.

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Appendix B: Definitions

Term	Common Definition
404 Mitigation	Section 404 of the HMGP provides funds to protect undamaged parts of a facility or to reduce the risk of future disasters. The state receives a percentage of the total Federal share of the declared disaster damage amount and can use it to fund projects anywhere in the state.
406 Mitigation	406 mitigation is a FEMA program that provides funding for cost-effective measures to reduce the risk of future damage to facilities that have been damaged by a disaster. Only available in counties that have been declared disaster areas, and only to applicants who are eligible for permanent work repairs under FEMA's PA program
428	428 mitigation, also known as the PA Alternative Procedures (PAAP), is a FEMA program that allows for using fixed-cost estimates to award PA funding for disaster recovery projects. The goal of 428 is to reduce disaster costs, speed up recovery, and give states more flexibility in how they use recovery funds. The Sandy Recovery Improvement Act of 2013 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act to add Section 428.
After-Action Report	A document intended to capture observations of an exercise and make recommendations for post-exercise improvements.
After-Action Report/Improvement Plan	The main product of the Evaluation and Improvement Planning process. The After-Action Report/Improvement Plan (AAR/IP) has two components: an AAR, which captures observations of an exercise and makes recommendations for post-exercise improvements; and an IP, which identifies specific corrective actions, assigns them to responsible parties, and establishes targets for their completion.
ALERTCalifornia	Based at the UCSD, ALERTCalifornia is a public safety program working to understand natural disasters and determine short and long-term impacts on people and the environment to inform management decisions.
Build America Bureau	The Build America Bureau was created in July 2016 by the U.S. Department of Transportation in response to the Fixing America's Surface Transportation Act (FAST Act) of 2015. The Bureau's purpose is to consolidate and manage transportation funding and finance programs, and to support the development of transportation infrastructure projects.
Building Resilient Infrastructure and Communities	FEMA’s BRIC annual grant program supports SLTTs as they implement hazard mitigation projects to reduce the risks from disasters and natural hazards. The program is authorized by the Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). FEMA funds BRIC with a 6% set-aside from Federal post- disaster grant funds, such as PA and IA grants. As a competitive grant program, applicants can apply on an annual basis.
Community Development Block Grant	HUD’s Community Development Block Grant (CDBG) Program supports community development activities to build stronger and more resilient communities through an ongoing process. Activities may address needs such as infrastructure, economic development projects, public facilities installation, community centers, housing rehabilitation, public services,

	clearance/acquisition, microenterprise assistance, code enforcement, homeowner assistance, etc.
Community Development Block Grant Disaster Recovery	HUD provides flexible CDBG-DR funds to help cities, counties, and states to recover from Presidentially declared disasters.
Community Disaster Resilience Zones	The Community Disaster Resilience Zones Act of 2022 amends the Stafford to require FEMA to utilize a natural hazard risk assessment index to identify census tracts which are most at risk from the effects of natural hazards and climate change.
Community Lifelines	The concept of community lifelines arose from the turbulent 2017 disaster season. It acknowledges the primary role of critical infrastructure in responding to events and the interconnected and cascading effects of one infrastructure on another. Community lifelines are not integrated into Core Capabilities.
Comprehensive Preparedness Guide	CPG 101 provides guidance for developing EOPs. It promotes a common understanding of the fundamentals of risk-informed planning and decision making to help planners examine a hazard or threat and produce integrated, coordinated, and synchronized plans. The goal of CPG 101 is to assist in making the planning process routine across all phases of emergency management and for all homeland security mission areas. This Guide helps planners at all levels of government in their efforts to develop and maintain viable, all-hazards, all-threats emergency plans.
Core Capabilities	The National Preparedness Goal identifies five mission areas and 32 core capabilities intended to assist everyone who has a role in achieving all the elements in the Goal. States are expected to set targets for each of these and assess their capabilities every three years. For Disaster Response there are 15 core capabilities: Planning; Public Information and Warning; Operational Coordination; Infrastructure Systems; Critical Transportation; Environmental Response/Health and Safety; Fatality Management Services; Fire Management and Suppression; Logistics and Supply Chain Management; Mass Care Services; Mass Search and Rescue Operations; On-Scene Security, Protection, and Law Enforcement; Operational Communications; Public Health, Healthcare, and Emergency Medical Services; and Situational Assessment.
CORE Employee	FEMA's CORE are hired to work for a specific, limited period, between two to four years. These positions may be renewed if there is ongoing disaster work and funding is available. CORE employees are generally eligible for the same benefits as Permanent Full-Time (PFT) employees, but do not gain competitive status nor career tenure during their term.
Defense Production Act of 1950	The Defense Production Act is a U.S. law that grants the President powers to ensure the nation's defense by expanding and expediting the supply of materials and services from the domestic industrial base. This Act also plays a pivotal role in enhancing the nation's preparedness and response to emergencies, including natural disasters, acts of terrorism and other significant threats.

Defense Support of Civil Authorities	DSCA is support provided by U.S. Federal military forces, DOD civilians, DOD contract personnel, DOD Component assets, and, in coordination with the Governors, Federally funded National Guard forces in response to requests for assistance from civil authorities for domestic emergencies, law enforcement support, and other domestic activities, or from qualifying entities for special events
Disaster Recovery Centers	FEMA Disaster Recovery Centers (DRCs) are temporary offices set up after a disaster to provide support to impacted areas and communities. These offices may assist with the application process, answer questions about your application, and help you submit information to FEMA. You may also visit other disaster support partners (e.g., SBA, the Red Cross) at a DRC.
Disaster Recovery Reform Act	The Disaster Recovery Reform Act (DRRA) of 2018 amends the Stafford Act and aims to reduce the complexity of FEMA and build the nation's capacity for the next catastrophic event. The law contains 56 distinct provisions that require FEMA policy or regulation changes for full implementation.
Disaster Relief Fund	The Disaster Relief Fund (DRF) is an appropriation against which FEMA can direct, coordinate, manage, and fund eligible response and recovery efforts associated with domestic major disasters and emergencies that overwhelm State resources pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Through the DRF, FEMA can fund authorized Federal disaster support activities and eligible SLTT actions such as providing emergency protection and debris removal.
Emergency Management Accreditation Program	EMAP, an independent non-profit organization, fosters excellence and accountability in emergency management programs by establishing credible standards applied in a peer-reviewed accreditation process. Accreditation has five steps, and to maintain it, organizations undergo the process every five years to be reaccredited.
Emergency Management Assistance Compact	EMAC is a national interstate mutual aid agreement that enables states to share resources during times of disaster. EMAC acts as a complement to the Federal disaster response system, providing timely and cost-effective relief to states requesting assistance from assisting member states who understand the needs of jurisdictions that are struggling to preserve life, the economy, and the environment. EMAC can be used either in lieu of Federal assistance or in conjunction with Federal assistance, thus providing a "seamless" flow of needed goods and services to an impacted state. EMAC further provides another venue for mitigating resource deficiencies by ensuring maximum use of all available resources within member states' inventories.
Emergency Management Performance Grant	The EMPG provides SLTT emergency management agencies with the resources required to implement the National Preparedness System and work toward the National Preparedness Goal of a secure and resilient nation. The EMPG's allowable costs support efforts to build and sustain core capabilities across the prevention, protection, mitigation, response, and recovery mission areas.
Emergency Management Program	EMAP defines an Emergency Management Program as a jurisdiction-wide system that provides for management and coordination of prevention, mitigation, preparedness, response, and recovery activities for all hazards. The system encompasses all organizations, agencies, departments, entities, and individuals responsible for emergency management and homeland security for that jurisdiction.

Emergency Support Functions	ESFs provide the structure for coordinating Federal interagency support for a Federal response to an incident. They are a way to group functions that provide Federal support to states and Federal-to-Federal support, both for Stafford Act declared disasters and emergencies and for non-Stafford Act incidents.
Equity	In 2021, FEMA defined equity as "[t]he consistent and systematic fair, just and impartial treatment of all individuals."
Fire Management Grant	FMAG Program is available to states, local and Tribal governments, for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster.
Flood Insurance Rate Map	A Flood Insurance Rate Map (FIRM) is the official map of a community on which FEMA has delineated the SFHAs, the Base Flood Elevations (BFEs) and the risk premium zones applicable to the community.
Flood Mitigation Assistance	FEMA makes Federal funds available through the FMA program to SLTT governments to reduce or eliminate the risk of repetitive flood damage to buildings insured under the NFIP.
Governor's Authorized Representative	A GAR is a person appointed by the governor to carry out disaster assistance documents and provide executive leadership for the state's disaster response.
GridEx	Hosted every two years by the Electricity Information Sharing and Analysis Center (E-ISAC), GridEx gives E-ISAC member and partner organizations a forum in which to practice how they would respond to and recover from coordinated cyber and physical security threats and incidents. It is the largest grid security exercise in North America.
Homeland Security Presidential Directive	A Homeland Security Presidential Directive (HSPD) is a directive issued by the President of the U.S. to establish a policy or set of guidelines for homeland security
Immediate Needs Funding	When the DRF is projected to be insufficient to meet all Stafford Act requirements, FEMA must prioritize lifesaving and life-sustaining activities. Under INF, FEMA prioritizes response and urgent recovery efforts without any interruption. However, new obligations not necessary for lifesaving and life-sustaining activities will be paused.
Incident Command System	The ICS is a single standardized emergency management system designed to allow users to adopt an integrated organizational structure equal to the complexity and demands of any size or type emergency incident. It functions to incorporate and fully utilize all assigned resources and expertise from multiple agencies and can operate in a multi-jurisdictional environment. The ICS provides accurate information, strict accountability, planning, and cost-effective operations and logistical support for any incident. Developed in California in the mid-1970s, ICS is now mandated by presidential directive for all emergency response in the U.S. In the past decades, it has been used to deal with virtually every kind of natural disaster as well as many other types of emergencies such as the September 11th terrorist attacks, the crash of the Columbia Space Shuttle, and hurricanes in Florida and along the Gulf Coast.
Incident Management Assistance Teams	FEMA developed a rapidly deployable emergency response teams called IMATs. The IMATs are full-time, rapid-response teams with dedicated staff able to deploy within two hours and arrive at an incident within 12 hours to

	support the local incident commander. The teams support the initial establishment of a unified command and provide situational awareness for Federal and state decision-makers crucial to determining the level and type of immediate Federal support that may be required.
Individual Assistance	FEMA's IA program provides financial and direct assistance to eligible individuals and families affected by a disaster. The program's goal is to help survivors return to a safe and functional home and to supplement SLTT government recovery efforts.
Individuals and Households Program	Funded by FEMA's DRF, the Individuals and Households Program (IHP) provides financial and direct services to eligible individuals and households affected by a disaster who have uninsured or under-insured necessary expenses and serious needs. IHP assistance is not a substitute for insurance and cannot compensate for all losses caused by a disaster. The assistance is intended to meet basic needs and supplement disaster recovery efforts.
Infrastructure Investment and Jobs Act	The IIJA, aka Bipartisan Infrastructure Law (BIL), of 2021 authorizes $1.2 trillion for transportation and infrastructure spending with $550 billion of that figure going toward "new" investments and programs.
Incident Levels	FEMA's ICS uses a classification system of Level I, II, and III incidents to indicate the complexity of an incident and the resources needed to respond: • Level I: The least complex incident, requiring the fewest resources. • Level II: An incident that requires a hazardous materials team to mitigate and is beyond the capabilities of the agency with jurisdictional responsibility. • Level III: The most complex incident, requiring the most resources.
Lines of Effort	LOE are applied to community lifelines. LOE are intermediate response objectives that require actions to bring community lifelines to a stabilized state where Federal assistance is no longer required (Federal Interagency Operations Plan, 2023). LOE can span from response to recovery. LOEs allow Federal and SLTT governments and private infrastructure providers to work together to meet stabilization needs. LOE guidance aids in understanding the tasks, resources, and information to formulate stabilization objectives.
Mitigation Framework Leadership Group	The MitFLG is a group of Federal agencies that coordinate mitigation efforts across the Federal government. The MitFLG was authorized by the PKEMRA of 2006 and organizes Federal efforts to deliver the mitigation core capabilities in the National Mitigation Framework.
Most Impacted and Distressed	"Most Impacted and Distressed" (MID) is a term used by HUD to describe areas that have been most affected by a major disaster. HUD may designate a zip code or an entire jurisdiction as MID. Grantees must use at least 80% of their CDBG-DR funds to address needs in these areas.
National Critical Function	NCFs are functions of government and the private sector so vital to the U.S. that their disruption, corruption, or dysfunction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof.
National Disaster Recovery Framework	The NDRF is a guide to promote effective recovery, particularly for those incidents that are largescale or catastrophic. The NDRF provides guidance that enables effective recovery support to disaster-impacted States, Tribes and local jurisdictions. It provides a flexible structure that enables disaster

	recovery managers to operate in a unified and collaborative manner. It also focuses on how best to restore, redevelop, and revitalize the health, social, economic, natural, and environmental fabric of the community and build a more resilient Nation. The NDRF defines: • Core recovery principles; • Roles and responsibilities of recovery coordinators and other stakeholders; • A coordinating structure that facilitates communication and collaboration among all stakeholders; • Guidance for pre- and post-disaster recovery planning; and • The overall process by which communities can capitalize on opportunities to rebuild stronger, smarter, and safer.
National Flood Insurance Program	The NFIP is a program that makes federally backed flood insurance available in states and communities that agree to adopt and enforce flood-plain management ordinances to reduce future flood damage. The program of flood insurance coverage and floodplain management is administered under the Act and applicable Federal regulations promulgated in Title 44 of the Code of Federal Regulations, Subchapter B.
National Incident Management System	NIMS guides all levels of government, nongovernmental organizations, and the private sector to work together to prevent, protect against, mitigate, respond to, and recover from incidents. NIMS provides stakeholders across the whole community with the shared vocabulary, systems, and processes to successfully deliver the capabilities described in the National Preparedness System. NIMS defines operational systems that guide how personnel work together during incidents.
National Preparedness Goal	The National Preparedness Goal defines what it means for the whole community to be prepared for all types of disasters and emergencies. The goal itself is "A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk." These risks include events such as disasters, pandemics, chemical spills and other man-made hazards, terrorist attacks and cyber-attacks.
National Response Framework	The National Response Framework (NRF) is a guide to how the nation responds to all types of disasters and emergencies. It is built on scalable, flexible, and adaptable concepts identified in NIMS to align key roles and responsibilities. The NRF is structured to help jurisdictions, citizens, nongovernmental organizations, and businesses: • Develop whole community plans; • Integrate continuity plans; • Build capabilities to respond to cascading failures among businesses, supply chains, and infrastructure sectors; and • Collaborate to stabilize community lifelines and restore services.
National Risk and Capability Assessment	The National Risk and Capability Assessment (NRCA) is a suite of assessment products that measures risk and capability across the nation in a standardized and coordinated process. When analyzed together, these products will better measure national risks, capabilities, and gaps. The results will be reported in future National Preparedness Reports.

Nature-based infrastructure	NBI, also referred to as green infrastructure, uses existing natural areas (and engineered solutions that mimic natural processes) to minimize flooding, erosion, and runoff. Additional benefits can include increased recreational opportunities and wildlife habitat, as well as cleaner water.
Post-Katrina Emergency Management Reform Act	The PKEMRA of 2006 was enacted to address various shortcomings identified in the preparation for and response to Hurricane Katrina. The act enhances FEMA's responsibilities and its autonomy within DHS. FEMA is to lead and support the nation in a risk-based, comprehensive emergency management system of preparedness, protection, response, recovery, and mitigation.
Presidential Policy Directive	Presidential Directives are a specific form of Executive Order that state the Executive Branch's national security policy, and carry the force and effect of law, stating requirements for the Executive Branch.
Project Worksheet	A FEMA Project Worksheet (PW) is a form used to document the project and includes the location, damage description and dimensions, scope of work, and cost estimate for each project. It is the primary form used to apply for Program PA funding.
Public Assistance	FEMA's PA Program provides supplemental grants to SLTT governments, and certain types of private non-profits so communities can quickly respond to and recover from major disasters or emergencies. PA covers costs such as debris removal, life-saving emergency protective measures, and restoring public infrastructure.
Public Assistance Alternative Procedures	The Sandy Recovery Improvement Act of 2013 amended the Stafford Act by adding Section 428, which authorizes FEMA to develop alternative procedures for PA permanent work projects. These procedures are referred to as PA Alternative Procedures (PAAP). Funding for PAAP projects is based on the estimated cost to restore the facility to its pre-disaster design and function while meeting compliance with current codes and standards. For large projects under Section 406 standard procedures, initial obligations may be made based on estimates, but final financial reconciliation is based on actual costs.
Public Private Partnerships	P3s are contractual agreements between a public agency and a private entity that allow for greater private participation in the delivery of projects.
Recovery DARES Program	Recovery DARES is an internal agency activity that is part of FEMA's approach to disaster recovery. This approach focuses on "Helping people and communities, Delivering holistic recovery, Making recovery more resilient, Meeting the people they serve and seeing the mission, and Ensuring recovery is a place where people want to work."
Recovery Support Functions	The RSFs are a set of FEMA programs that help SLTT governments, as well as the private and nonprofit sectors, recover from disasters.
Repetitive Flood Loss Properties	A Repetitive Loss property is any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling ten-year period, since 1978. A Repetitive Loss property may or may not be currently insured by the NFIP.
Resilience	The ability to prepare for threats and hazards, adapt to changing conditions and withstand and recover rapidly from adverse conditions and disruptions.

Risk Rating 2.0	As of April 1, 2023, FEMA has fully implemented the NFIP's pricing approach, Risk Rating 2.0. The approach leverages industry best practices and cutting-edge technology to enable FEMA to deliver rates that are actuarially sound, equitable, easier to understand and better reflect a property's flood risk. It is the biggest change to the way the NFIP calculates flood insurance premiums since the program began in 1968. Premiums calculated under Risk Rating 2.0 reflect an individual property's specific flood risk, as opposed to being placed in a general risk category based on location and property type.
Safeguarding Tomorrow through Ongoing Risk Mitigation (STORM) Act	The STORM Act of 2021 amended the Stafford Act to authorize FEMA to provide capitalization grants to states, eligible federally recognized tribes, territories, and the District of Columbia to establish revolving loan funds that provide hazard mitigation assistance for local governments to reduce risks from natural hazards and disasters.
Sandy Recovery Improvement Act	The Sandy Recovery Improvement Act of 2013 amended the Stafford Act to authorize several significant changes to the way FEMA delivers Federal disaster assistance to survivors and communities.
Sector Coordinating Councils	The private sector counterpart to the Government Coordinating Councils, SCCs are self-organized, self-run, and self-governed organizations that are representative of a spectrum of key stakeholders within a sector. They serve as principal entry points for the government and SRMAs to collaborate with each of the 16 critical infrastructure sectors for developing and coordinating a wide range of critical infrastructure security and resilience activities and issues.
Sheltering and Temporary Essential Power	STEP is a program managed by a State, funded by FEMA PA, that provides homeowners with limited, temporary repairs to make a home safe, clean, and secure for emergency sheltering. This allows homeowners to shelter in their damaged homes while longer-term repairs continue, meaning people can return to work and school in their communities.
Social Vulnerability	FEMA defines this as "the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood." According to the CDC, higher levels of social vulnerability are associated with poverty, limited English proficiency, disability, and minority status.
Special Flood Hazard Area	Flood hazard areas identified on the Flood Insurance Rate Map are designated as SFHA. SFHAs are defined as areas that will be inundated by a flood event that has a 1% chance of being equaled or exceeded in any given year. Structures located in SFHAs have a 26% chance of suffering flood damage over the normal 30-year life of a home loan, according to FEMA.
Stafford Act	The Robert T. Stafford Disaster Relief and Emergency Assistance Act, also known as the Stafford Act, is a Federal law that gives the president the power to declare disasters and provide Federal assistance to affected areas. The Stafford Act also establishes a process for allocating disaster response costs among Federal, state, local, and Tribal governments.
State Coordinating Officer	A SCO is a person appointed by the governor of a state to oversee the state's response and recovery efforts during a disaster. The SCO works with other officials to coordinate the efforts of the state, Federal, Tribal, and local governments.

Swift Current	The FMA Swift Current (Swift Current) effort provides funding to SLTT governments to mitigate buildings insured through the NFIP after a presidentially declared disaster to reduce flood risk. Swift Current focuses on streamlining funding for individual residential buildings when policyholders are in the recovery process, whereas the competitive FMA funding opportunity has a broader range of flood mitigation activities and projects on a competitive basis once a year.
Threat and Hazard Identification and Risk Assessment	The THIRA is a three-step risk assessment process that helps communities understand their risks and what they need to do to address those risks by answering the following questions: 1. What threats and hazards can affect our community? 2. If they occurred, what impacts would those threats and hazards have on our community? 3. Based on those impacts, what capabilities should our community have?
Transitional Sheltering Assistance	Transitional Sheltering Assistance is a FEMA program and must be requested by a state. It allows for temporary, short-term accommodations for eligible survivors when other housing options are not available after a presidentially declared disaster.
Transportation Infrastructure Finance and Innovation Act	The TIFIA program, administered by the DOT's Build America Bureau, provides long-term, low-interest loans and other types of credit assistance for the construction of surface transportation projects. The program was reauthorized in the FAST Act in 2015. The TIFIA program has been one of the main ways in which the Federal government has encouraged the development of P3s and private financing in surface transportation.
Underserved Communities	FEMA defines these as "populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life." Examples include communities of individuals that have been "denied consistent and systematic fair, just, and impartial treatment" including "Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality."
Urban Search and Rescue	The National Urban Search & Rescue (US&R) Response System, established under FEMA's authority in 1989, is a framework for organizing Federal, state, and local partner emergency response teams as integrated Federal disaster response task forces. The System's 28 US&R task forces can be deployed by FEMA to a disaster area to aid in structural collapse rescue, or they may be pre-positioned when a major disaster threatens a community.

Appendix C: Acronyms and Abbreviations

Acronym/ Abbreviation	Definition
AAR	After-Action Report
AI	Artificial Intelligence
ASCE	American Society of Civil Engineers
BCA	Benefit-Cost Analysis
BRIC	Building Resilient Infrastructure and Communities
CAL FIRE	California's Department of Forestry and Fire Protection
CBO	Congressional Budget Office
CBRN	Chemical, Biological, Radiological, and Nuclear
CDBG-DR	Community Development Block Grant - Disaster Recovery
CDBG-MIT	Community Development Block Grant - Mitigation
CDRZ	Community Disaster Resilience Zones
CESER	Office of Cybersecurity, Energy Security, and Emergency Response
CISA	Cybersecurity and Infrastructure Security Agency
CORE	Cadre of On-Call Response and Recovery Employees
CPG	Comprehensive Preparedness Guide
CPI	Consumer Price Index
CREW	Civilian Reservist Emergency Workforce
DEO	U.S. Department of Energy
DHS	U.S. Department of Homeland Security
DOD	U.S. Department of Defense
DOT	U.S. Department of Transportation
DRC	Disaster Recovery Center
DRF	Disaster Relief Fund
DSCA	Defense Support of Civil Authorities
EHP	Environmental and Historic Preservation
EMAC	Emergency Management Assistance Compact
EMAP	Emergency Management Accreditation Program
EMPG	Emergency Management Performance Grant
EO	Executive Order
EOP	Emergency Operations Plan
ESF	Emergency Support Function
FEMA	Federal Emergency Management Agency
FHFA	Federal Housing Finance Agency
FIRM	Flood Insurance Rate Maps
FMA	Flood Mitigation Assistance
FMAG	Fire Management Assistance Grant
GAO	Government Accountability Office
GAR	Governor's Authorized Representative
GSE	Government Sponsored Enterprise

HHS	U.S. Department of Health and Human Services
HMGP	Hazard Mitigation Grant Program
HSPD	Homeland Security Presidential Directive
HUD	U.S. Department of Housing and Urban Development
IA	Individual Assistance
ICS	Incident Command System
IHP	Individuals and Households Program
IIJA	Infrastructure Investment and Jobs Act
IM	Incident Management
IMAT	Incident Management Assistance Team
INF	Immediate Needs Funding
LOE	Lines of Effort
MID	Most Impacted and Distressed
NAS	National Academy of Sciences
NBI	Nature-based infrastructure
NBIGC	National Building Information Guide Council
NCF	National Critical Function
NDRF	National Disaster Recovery Framework
NFIP	National Flood Insurance Program
NIAC	National Infrastructure Advisory Committee
NIBS	National Institute of Building Sciences
NIMS	National Incident Management System
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NRF	National Response Framework
NSC	National Security Council
OAFN	Office of Access and Functional Needs
OIG	Office of Inspector General
PA	Public Assistance
PAAP	Public Assistance Alternative Procedures
PKEMRA	Post-Katrina Emergency Management Reform Act
PPD	Presidential Policy Directive
SBA	U.S. Small Business Administration
SCO	State Coordinating Officer
SFHA	Special Flood Hazard Area
SLTT	State, Local, Tribal, and Territorial
SRMA	Sector Risk Management Agency
STEP	Shelter and Temporary Essential Power
STORM	Safeguarding Tomorrow through Ongoing Risk Mitigation
THIRA	Threat and Hazard Identification and Risk Assessment
TIFIA	Transportation Infrastructure Finance and Innovation Act
UCSD	University of California, San Diego

USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
USVI	U.S. Virgin Islands
USDA	U.S. Department of Agriculture
P3	Public-Private Partnership

Appendix D: References

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