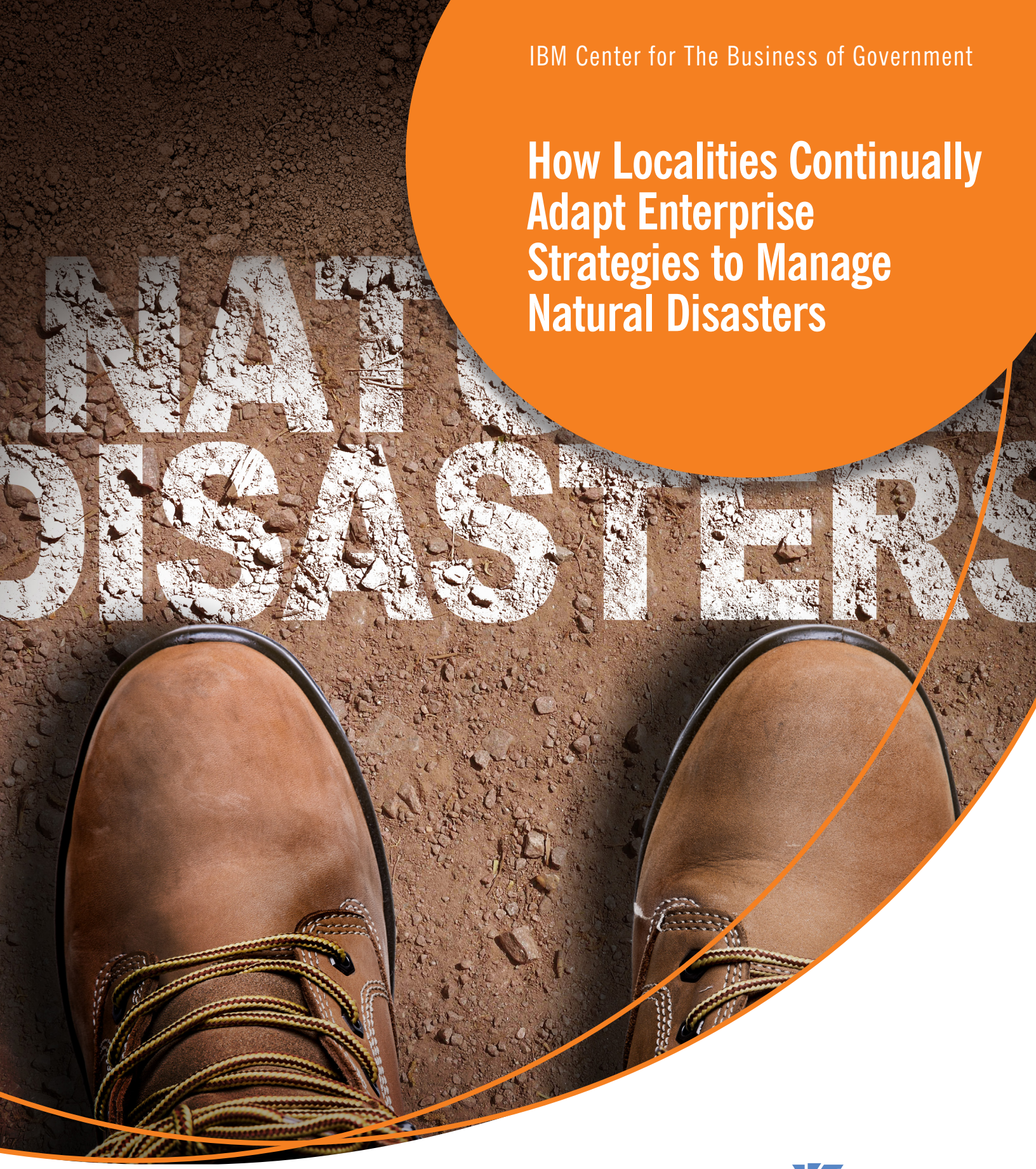
IBM Center for The Business of Government

How Localities Continually Adapt Enterprise Strategies to Manage Natural Disasters



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FOREWORD

On behalf of the IBM Center for The Business of Government, we are pleased to present this report, *How Localities Continually Adapt Enterprise Strategies to Manage Natural Disasters,* by Katherine Willoughby (University of Georgia), Komla Dzigbede (SUNY Binghamton) and Sarah Beth Gehl (Roosevelt Institute).

In recent months, we've seen massive, record-breaking wildfires, a record-breaking number of hurricanes, and a punishing derecho in the Midwest. As climate change continues, we can only anticipate more in the months and years to come.

All natural disasters are local. Therefore, it is only natural that local governments will be those who are relied upon to be the first responders and to pick up the pieces afterward to help citizens restore their lives, livelihoods, and communities.

But are localities prepared? The authors of this report delve into city-level surveys of hundreds of communities, conducted by the International City/County Managers Association, to learn firsthand what challenges local leaders face and how they prepare in advance to blunt the effects of natural disasters. They interviewed dozens of local leaders for their advice and insights and then used these insights to develop a framework that can guide local leaders as they strategize ways to minimize the effects of natural disasters on their communities and economies in the future.

We hope this report provides local leaders a useful framework for prioritizing their emergency response efforts in coming years, as the weather will likely continue to be frightful.

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EXECUTIVE SUMMARY

This report examines ways U.S. local governments apply enterprise approaches in natural disaster preparedness, emergency management, and post-disaster recovery to mitigate disaster risk, achieve efficient governance outcomes, and promote economic recovery.

Our research assesses local governments' past experiences and current preparation efforts for natural disasters. Our investigation examined governments' operational structures of emergency preparedness, shared services, and collaborative networks for disaster response and management, as well as these governments' accounting of financial assets and fiscal resources before, during and after disasters. We describe government tools and strategies available to support efficient and effective relief and recovery outcomes in the event of disaster.

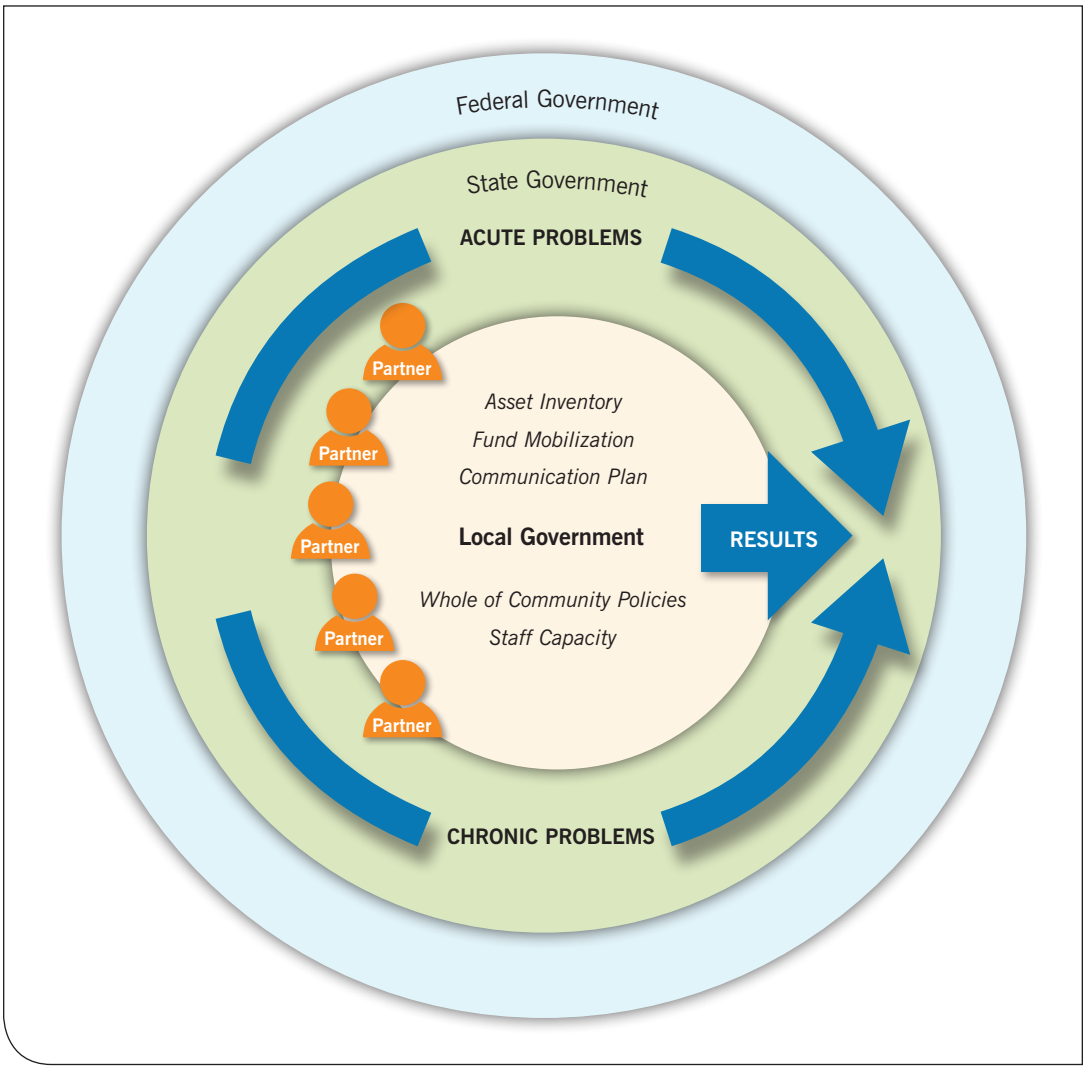
The capacity of local governments to cope with such disasters is affected by their increasing number, frequency, and severity—and because of ongoing budget and revenue constraints at all levels of government. We examine an enterprise approach—reaching across organizational boundaries—that recognizes a local government's emphasis on high-quality and efficient operations and service delivery that is outcome-focused and collaborative and aligns well with the overall mission of the locality. It also considers the extent to which the locality prepares for and uses shared partnerships with other governments and nongovernmental stakeholders in mitigating the effects of natural disaster. Thus, "enterprise approach" as used in this report refers to internal and external strategies that local governments leverage to weather disasters. We study U.S. general purpose local governments in terms of their readiness or preparedness for natural disastrous events.

Based on our analysis of survey results and interviews with local officials, we propose six specific enterprise strategies that localities can adopt and adapt to build greater resiliency and that can support economic recovery following a natural disaster:

- Strategy One: Develop a network of horizontal and vertical partners
- Strategy Two: Develop policies using a whole of community approach
- Strategy Three: Maintain a current inventory of assets
- Strategy Four: Understand in advance the financial options available
- Strategy Five: Jointly train and conduct exercises
- Strategy Six: Develop a public communications plan in advance

We define "resiliency" as the ability of a locality to weather a natural disaster with the least losses in terms of human life, public and private property, and finances. Resiliency that supports economic development following disaster implies government ability and capacity to sustain ongoing functions, services, and programs with ongoing resources once disaster strikes and following the event.

Our interviewees helped us describe the state of practice among U.S. local governments for natural disaster preparedness and tease out the benefits of engaging certain strategies for effective management post disaster. We conclude with an enterprise framework that depicts roles of various stakeholders that local government governments should enlist to ensure resiliency when faced with weather-related natural disasters.



This framework incorporates both the *chronic* problems of communities, such as poverty, homelessness, and crime, among others, as well as the *acute* problems of natural (and other) disasters that these governments must manage through regularly. Our framework of stakeholders would implement the six pre-disaster enterprise strategies that local governments should undertake to ensure a solid foundation for resiliency and economic recovery in the aftermath of disaster and well into the future. No locality will likely have each of these strategies at the ready to support disaster management. Furthermore, localities may find a need to adapt various strategies and/or change the mix of strategies over time to help weather disasters with the fewest losses, as local circumstances evolve.

This study does not consider recovery from man-made disasters such as mass shootings, ransomware attacks, train wrecks or the like. While our research coincides with the onset of the global pandemic, the Coronavirus outbreak, in the spring of 2020, we do not include analysis specific to local government management of that natural biological disaster here. Still, the study's framework of various enterprise strategies should have high relevance for all types of disasters.

Research Methodology

- Search of academic literature, government documents, fiscal and performance reports, think tank reports, and media news outlets
- Mining and analysis of relevant government agency, think tank, and academic webinars, presentations, podcasts, and other products
- Analysis of state government emergency management performance reports and audits
- Analysis of ICMA electronic survey of local governments, 2015 and 2019
- Interviews with 21 local officials in governments affected by disasters in the past

INTRODUCTION

Weather-Related Natural Disasters Are a Growing Threat to Local Governments

The natural disaster problem is complex, ever changing, and a tremendous threat to the resiliency of governments globally, and perhaps most especially, to those governments closest to people and property. Contributors to the problem include climate change that manifests in the increasing number, intensity and/or frequency of natural disasters, but also population growth, development density, expansive hardscapes and infrastructure, and even ever-growing dependence on information technology. The U.S. National Preparedness System, which is operated by the Federal Emergency Management Agency (FEMA), emphasizes that governments at all levels must support disaster preparation with effective administrative, logistic, and fiscal resource management systems to bolster community response and recovery when disasters occur. However, local governments are the "boots on the ground" in terms of public service delivery and so are first responders in times of crisis.

In the era of COVID-19, no one can deny that modern government managers must conduct perpetual disaster management. For example, a derecho ripped through several Midwestern states on August 10, 2020, bringing 100 mile-per-hour winds with the power of an "inland hurricane," and spreading destruction from Nebraska across multiple states to Michigan and beyond. Thus, amid a catastrophic biological natural disaster, these states and their local governments faced a devastating weather-related one. All the while, these same governments, along with others worldwide, must remain vigilant against man-made disasters like ransomware attacks or mass shootings and accidents like chemical explosions or building collapses. Finally, they must also manage civil unrest and/or protests. Savvy public officials and managers understand that they will need to battle multiple, successive strikes of various disasters and/or the simultaneous occurrence of assorted types of challenges throughout their tenure in public service.

In the case of weather-related natural disasters, the National Oceanic and Atmospheric Administration (NOAA) recounts the decade from 2010 to 2019 as "unprecedented" in the number of billion-dollar disasters. In the decade of the 1980s, the United States experienced 28 billion-dollar disasters, costing $128 billion and causing 2,808 fatalities. By the decade of the 2010s, the nation experienced 119 billion-dollar disasters, with total costs of $802 billion and associated fatalities of 5,212 (Smith 2020). NOAA points out that "four of the five most costly U.S. billion-dollar disasters occurred in the 2010s—Hurricanes Harvey, Irma, Maria, and Sandy" (Smith 2020). Also, in just the last three years, portions of the nation experienced the two most devastating, expensive wildfire seasons in U.S. history, incurring over $40 billion in losses. These losses are escalating today as the wildfires continue to rage.

Climate change has contributed to the variety, frequency, and intensity of weather-related natural disasters. Disaster types that have been experienced in the United States since 1980 include:

- Severe storms (113)
- Tropical cyclones/hurricanes (44)
- Flooding (32)
- Drought (26)
- Wildfires and winter storms (17 each)
- Freezes (9) (Smith 2020)

NOAA projects highly violent and frequent disasters to continue unabated. Currently, the lead seasonal hurricane forecaster at NOAA's Climate Prediction Center predicts an extremely active hurricane season in 2020 alone: "This year, we expect more, stronger, and longer-lived storms than average" (U.S. Department of Commerce 2020).

Nonetheless, research indicates climate change as just one factor leading to greater frequency, violence, and costs associated with weather-related natural disasters (Banholzer 2014; Sauerborn and Ebi 2012). Increasing human and hardscape density, and material wealth with growing populations and development along the nation's coasts and river floodplains, are recognized as direct causes of the explosive costs associated with such disasters. Growing exposure (the value at risk of possible loss due to disaster) and vulnerability (the damages resulting from ever increasing destructive aspects of disasters) are components of disaster management that governments, communities, and individuals can address to help reduce the costs of both response and recovery from catastrophic events (Hayhoe et al. 2018). Far too many local governments and individuals have over-relied on self-insurance after a disaster. As a result, the challenge of inadequate insurance of personal as well as public property is both significant and extensive in communities across the country.

Every type of disaster imposes costs—of weather-related natural disasters, those most violent can leave communities decimated in the short-term and financially fragile in the mid- to long-term. In all cases, the context of the community, the extant disaster, and the process of recovery are unique. That is, no two communities are exactly alike in capacity to withstand disaster, adapt to new circumstances following disaster, and ultimately, to restore, rebuild, and recover in the aftermath of disaster. Distinguishing features of U.S. local governments indicates the variable risks and different impacts that these disasters can have among diverse types of local governments. For example, in the U.S., most people live in urban areas—currently close to 250 million live in these areas, with growth estimated to crest 350 million by 2050 (Cutter et al. 2014, 284). Big cities have highly integrated infrastructure and economic systems. Water, energy, and transportation systems comprise massive hardscapes and build-

ing infrastructure—damages to any or all systems can bring a city to a standstill. The population and housing density of big cities contributes to high risk exposure (Stambler et al. 2016). While urban environments are "wealth pools" and provide a foundation for high quality infrastructure development as well as the creation and engagement of sophisticated adaptive strategies by government to mitigate disastrous effects, these environments also foster social inequalities that exacerbate exposure and vulnerability to damages and costs in the aftermath of a disaster (Cutter et al. 2014).

On the other hand, Hales and colleagues (2014) recognize that U.S. land area is predominantly rural (95 percent), with almost a fifth of the U.S. population residing in rural communities. "Rural communities have economies and social structures highly dependent upon natural resources" (Hales et al. 2014). Entire livelihoods associated with farming, forestry, and recreation can be completely wiped out with a particularly violent storm. Rural communities are spread out, physically remote from other cities and towns, and may be inaccessible following disaster. Governments in these areas are poorer both in population and in fiscal capacity, as well as more economically homogeneous (Hales et al. 2014). Governments in rural communities have limited institutional or fiscal capacity to anticipate, plan for, and respond to climate change impacts.

Thus, there are many contributors to the problems of natural disasters that lead to damages to human life and physical property in their aftermath as well as the ever-increasing recovery costs. Local governments, those closest to people and property, are first responders in these times of crisis and often these governments are already on fragile fiscal footing when disastrous events occur. Thus, these governments stand to suffer tremendously following such catastrophes. Urban and rural governments have different challenges in terms of mitigating, planning for, responding to, and recovering from natural disasters. Because these challenges will only become more difficult, it is vital that these governments continue to hone employee skills and collective actions related to these emergencies. The following section examines the state of practice of U.S. local governments regarding their management approaches toward natural disasters.

State of Practice: Local Disaster Readiness Efforts

An enterprise approach refers to government acting creatively, integrating and unifying the efforts of all departments, agencies, and offices, guided by well-designed rules and procedures, and efficiently combining the inputs of public and private sector partners to achieve cross-cutting goals, missions and functions that provide lasting benefits for residents (Partnership for Public Service 2013). Such an approach results in desired outcomes by engaging all parts of the community, all parts of organizations, and all levels of government. Adapting various enterprise strategies supports resilience by repurposing resources and actions to manage through unexpected circumstances. In the context of natural disaster management, an enterprise approach to local disaster readiness involves a whole of community strategy "to engage the full capacity of the private and nonprofit sectors, including businesses, faith-based and disability organizations, and the general public, in conjunction with the participation of local, tribal, state, territorial, and federal governmental partners" (Federal Emergency Management Agency [FEMA] 2011, 3).

Becker and colleagues (2008) present a community resilience model that represents the whole of community concept and enterprise approach. This model recognizes personal, community, and institutional responsibilities for boosting community resilience. It emphasizes that:

- Individuals have a personal responsibility to engage a sense of community, critical awareness, and self-efficacy, and coping mechanisms.
- The community is responsible for collective efficacy, participation and commitment, communication flow, social support, and decision making.
- Institutional responsibilities include empowerment to act, engendering public trust to act on behalf of the community, and mechanisms for assisting in community problem solving.

Together, individuals, community groups, and institutions must bring resources, physical and/or fiscal, to the table. Thus, a whole of community approach for resiliency requires commitment, action, and attention of all. The approach collectively organizes and strengthens local assets and capacities (individual, community, and institutional) that can support an efficient and effective response when disaster strikes. An enterprise approach must be adaptive and flexible to accommodate the distinctive nature of any one disaster. Such an approach supports collaboration across all actors and emphasizes learning from one's own and others' experiences (Deloitte Limited 2018). For example, answering what to do to stop fires from happening given the current record of wildfires in the State of California, experts claim:

> [T]hat's the wrong question. Instead, they say, policymakers must recognize that wildfires will happen, and discourage or ban development in fire-prone areas. Local leaders must take steps to make their communities easier to flee on short notice, they say, and homeowners can do things to keep their homes from being damaged.
>
> *—Bronstein 2020, A3*

Recognizing U.S. Intergovernmental Roles in Disaster Management

This report regards U.S. local governments as first responders and explains present and possible enterprise strategies and efforts at this level to mitigate, plan for, respond to, and recover from natural disasters. The report recognizes the vital roles of the federal government and states, but support from these levels does not flow instantly, if at all, to a locality when disaster strikes. The federal government (primarily through the Federal Emergency Management Agency or FEMA) can provide funding that, if ably and smoothly channeled to the ground level in a timely way, can bolster a community's ability to return to "business as usual." However, over the years, mission creep and change as well as budgetary woes have thwarted this agency's ability to respond effectively across various disasters. Regarding FEMA's mission, by 2009, it read, "to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards." This recognized necessary collaboration ("work together") and concern for preparedness and began to temper public expectations about the federal role and responsibilities in times of disaster. Today, FEMA's mission is simple and concise, further honing public expectations: "helping people before, during, and after disasters" (FEMA 2018-2022, 7). In summary, the strategy for any disaster response and recovery is—executed locally, managed by the state, supported by the federal government as planned in the National Response Framework.

Personnel-wise, "FEMA is a minnow in the whale of the Department of Homeland Security" (DHS) (NCSL, 2017). The agency accounts for less than one percent of DHS personnel, and media attention of DHS's agenda—border protection, terrorism and the like can crowd out the FEMA agenda (NCSL, 2017). Further, adequate funding remains an ongoing problem for FEMA. The fiscal 2021 Trump Administration budget reduces FEMA's budget by half a billion dollars for state and local grants and training that the administration claims "are not federal responsibilities." Among numerous FEMA programs that could be impacted, "the Flood Hazard Mapping and Risk Analysis Program would lose more than half of its budget, as the administration argues 'flood hazard mapping is not solely a federal responsibility'" (Johnson, 2020). Such constant fiscal stress weakens the agency's ability to complete its mission.

States (and regional organizations) provide substantial training, supplies, and services to bolster local efforts to lessen the damages resulting from disaster and to support recovery. The 50 state emergency management agencies operate differently, however, in terms of everything from a governor's authority in emergencies and disasters, to how these agencies' budgets are funded, regarding payments for nonfederal portions of federal assistance, how state-funded disaster assistance programs are administered, how emergency management performance grants are allocated and local reimbursements made, and so on. This makes any suggestion of "one size fits all" partnering strategies by local governments not only impossible, but unhelpful.

Crow and colleagues (2018) study learning on the part of seven Colorado communities in three counties in the aftermath of flooding in 2013, focusing on local government finance policy change. Their findings attest to the fact that local officials must understand that they "will go it alone" in terms of response following disaster and likely in the recovery process. The scholars note multiple finance-related barriers to effective disaster recovery including: 1) the strict documentation needed given complex and multi-party reimbursement assistance, 2) the need for local officials to mine all possible funding resources, over and above those from federal and state governments, and 3) the need for expertise and resources at the local level to start recovery immediately. Roberts (2013) articulates lessons learned following Hurricane Katrina in 2005, among them, recognition that localities are first responders rather than FEMA (See also, National Academy of Public Administration 2020).

The following section examines the pre-disaster context of local governments, in terms of ordinances, readiness plans, and practice efforts to tease out enterprise approaches. It draws insights from two nationwide surveys of local disaster preparedness and sustainability efforts by the International City/County Management Association (ICMA).The ordinances of selected local governments are also examined to understand how they support resilience in the event of a natural disaster. The goal in this section is to identify the enterprise strategies that local governments are using to manage disastrous events.

2015 ICMA Survey of Local Government Sustainability Practices

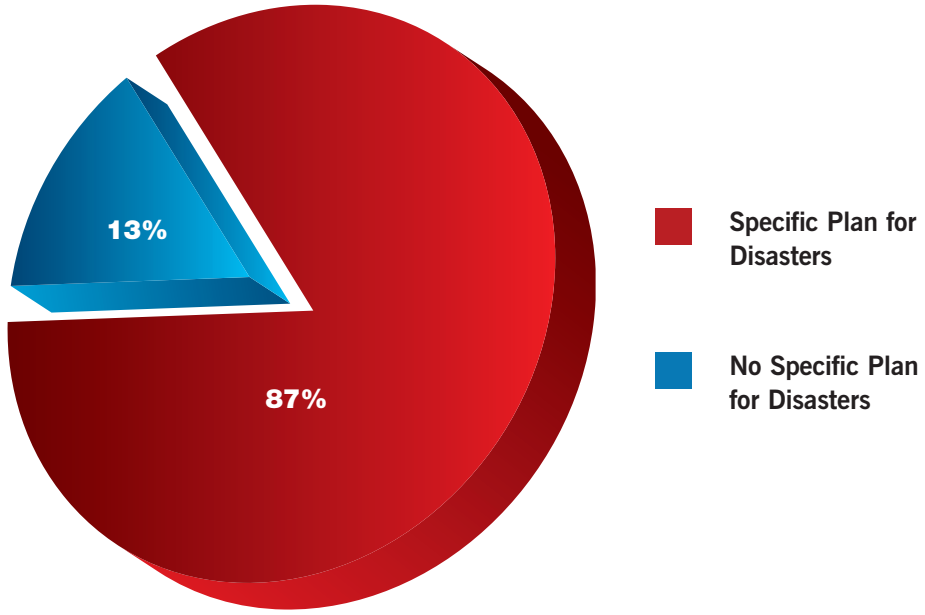
A survey of local government sustainability practices, conducted by ICMA in 2015, sheds light on the pre-disaster readiness of U.S. local governments. The ICMA administered the survey in 2015 to chief administrative staff in 8,562 local governments and realized a response rate of 22 percent. Local government responses to the survey indicate many governments have engaged enterprise strategies to strengthen pre-disaster readiness, including the adoption of whole-community readiness plans, but the survey also highlights areas of critical need of these governments to continually adapt strategies when combating future natural disasters.

For example, while a healthy majority of local governments indicated attention to their residents most at risk should disaster strike, relatively few have fully fleshed out plans for addressing the environmental effects from disasters.

- Less than one-third (32 percent) of local governments reported they have adopted an environmental sustainability plan that provides a broad framework for managing and reducing environmental impacts.
- Of this proportion, less than half (48 percent) reported their sustainability plan includes disaster mitigation strategies.
- Most (87 percent) local governments reported to have specific plans focused on disaster management, such as a hazard mitigation plan, or an emergency evacuation/relocation plan (see Figure 1).

Across the nation, the predominant challenge local communities face is the conflict between increasing tax base through development and the lack of building standards and zoning to mitigate costly losses in a natural disaster. Hence, the greatest opportunity for reducing the impact of disasters lies in more rigorous local planning, enhanced building standards, and responsible zoning (Nimmich 2020). It is encouraging that over two-thirds (69 percent) of those that have disaster management plans reported that these plans specifically address at-risk residents in the community, including low-income individuals and elderly persons.

Figure 1: Most Local Governments Have Specific Plans for Disaster Management



Source: ICMA Survey of Local Governments, 2015

The survey highlights an area of critical need to be public participation in disaster readiness and sustainability planning by local governments. That is, more than half of local government respondents (59 percent) reported that public participation had little or no impact in shaping their disaster readiness and sustainability plans and strategies. On the other hand, for those local governments that do include public participation in their disaster readiness and sustainability planning, they reported multiple ways residents participate, including via committee membership, service on commissions and task forces, attendance at public hearings and workshops, completion of community surveys, and participation on social media (e.g., Facebook, Twitter, etc.). Respondents also claim such participation in disaster readiness and sustainability planning is mainly through service on committees, commissions, and task forces, while public participation via social media is less prominent. Finally, only about one-fifth (19 percent) of local governments reported that they dedicate a budget line item for environmental sustainability efforts, including disaster readiness. This is not surprising, given that state and local governments must operate with balanced budget requirements.

These results indicate burgeoning local government efforts at developing disaster management plans, if not extending their efforts to more expansive ones regarding environmental impacts. Further, a predominance of local government inattention to a dedicated budget line to sustainability efforts and disaster management attests to a short-term over long-term consideration of disaster impacts. Still, local governments in 2015 exhibit some whole of community tendencies—well over half of respondents consider disastrous effects on their most at-risk residents. While local governments seem to offer multiple ways for the public to engage in sustainability planning, at least in 2015, participation had little influence on this process for most governments. This seems to call for greater individual and community efforts, along with local government encouragement for such participation. The survey evidence also suggests the need for more budgetary investments in local disaster management plans and environmental sustainability efforts to enhance resilience when confronted with catastrophic events.

2019 ICMA Survey of U.S. Local Government Fiscal Preparedness for Disaster

The ICMA survey conducted in 2019 elicited responses about local governments' natural disaster preparedness and included questions contributed by the authors regarding local efforts that support fiscal resiliency. The survey was distributed to principal administrative officials in 4,932 local governments and achieved a response rate of 18 percent (901 local governments). The survey findings provide insights on the enterprise strategies local governments have engaged to prepare for weather-related natural disasters, with specific attention to local pre-disaster efforts that support fiscal resiliency following such crises. Like the earlier survey of local sustainability practices, results from the disaster preparedness survey highlight areas of need for local governments to enhance their disaster readiness capacity to advance their resiliency when disasters strike.

Disaster readiness for fiscal resiliency on the part of local governments may incorporate multiple strategies. These include:

- Shoring up fiscal resources such as rainy-day funds earmarked for disaster-related activities
- Updating technology resources such as backup data storage and off-site information systems to support disaster management
- Establishing pre-disaster contracting, networks and partnerships, and including mutual assistance agreements
- Maintaining an up-to-date accounting of assets and costs
- Becoming familiar with disaster relief protocols and data needs

Most local governments (95 percent) responding to the survey reported they have at least one type of local fiscal resource available to support their response and recovery capacity when a major disaster occurs in the community. These fiscal resources include:

- Departmental funds
- Emergency funds
- Solid waste funds
- Insurance
- General fund reserves
- Debt or borrowing

Technological resources enhance the capacity of local governments to prepare for future natural disasters as well as to respond efficiently during and after a major disaster. The disaster preparedness survey indicated that most local governments (94 percent) have at least one form of technology resource or service available to support response and recovery from a disastrous event in the community, such as:

- Backup data storage for essential government records
- Emergency operations centers
- Geographic information systems
- Offsite information systems
- Maps of community assets

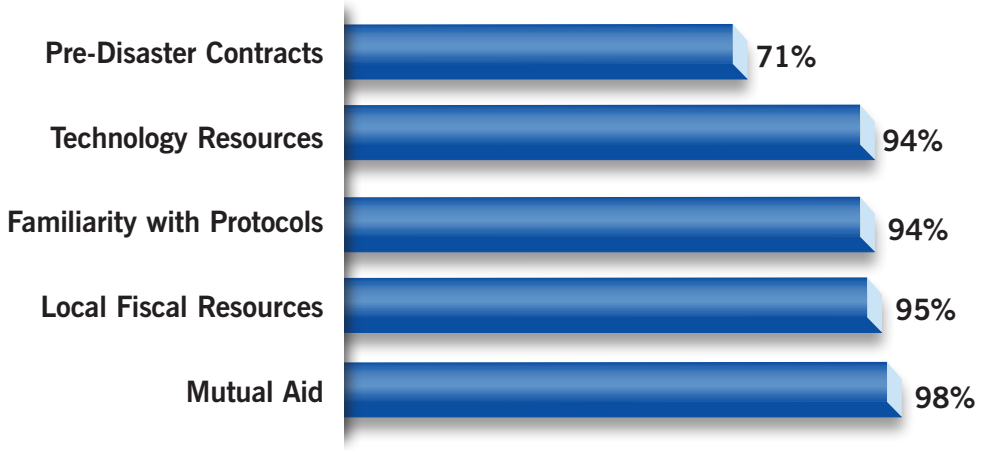
It should be recognized that while these resources can boost local disaster preparation and response, poor compatibility of technology systems across local, state and federal levels of government can stymie the process. In fact, Joseph Nimmich (2020), former Deputy Administrator of FEMA, points out that, "This is one of the most disruptive elements of dealing with a disaster."

Pre-disaster contracts pre-position services that vendors can provide and account for associated costs in the event of emergencies (Valcik and Tracy 2017). The existence of these contracts expands local capacity to respond to community needs during and following emergencies. Pre-disaster contracting also enhances relationship-building regarding helpful partners in times of crisis. Most local governments (71 percent) responding to the 2019 survey indicated they have at least one form of pre-disaster contract established to support efforts to respond, recover, and restore, following a major disaster. The form of pre-disaster contracts varied widely among these governments, covering anything from emergency management to debris removal, temporary housing, building inspection, and/or demolition of damaged buildings.

Mutual aid agreements with nearby jurisdictions are another form of partnership essential for sharing services and lending support when disaster strikes. Such agreements also make it possible for a local government to forge and deepen networks and relationships with nearby governments to strengthen total regional adaptive capacity. Most local governments (98 percent) have at least one type of mutual aid agreement with nearby governments; these agreements regard public works, public safety, public transportation, social and human services, animal control, and/or payroll or financial services. Relatedly, half of local governments (50 percent) reported having established formal partnerships with local nonprofit organizations, community groups, and religious societies that would be utilized to support recovery and restoration activities in the event of a natural disaster.

As can be expected, federal and state disaster relief funding comes following substantial justification on the part of a local government. That is, there are numerous protocols, calculations, and data requirements that local officials must conduct and provide to realize relief funding. Local managers' familiarity with these protocols is a critical aspect of local disaster readiness and keen knowledge can facilitate timely and efficient receipt of such assistance following disaster. Most local governments (94 percent) indicated being familiar with protocols for securing federal and state disaster relief resources. Over two-thirds of local government respondents (69 percent) reported they have developed or are developing financial accounting and valuation of all their capital assets that could be vulnerable to a disastrous event. Further, close to two-thirds (63 percent) reported they have undertaken or are undertaking risk analysis to determine which facilities (e.g., fire station, health center, etc.) or critical assets of the locality (e.g., major industries, housing stock, etc.) are most vulnerable to a major weather-related natural disaster. Of governments familiar with these protocols, a majority (58 percent) have applied for these resources in recent years. Figure 2 summarizes disaster readiness capacity of local governments in terms of own source funds, technology resources, pre-disaster contracts, mutual aid agreements, and familiarity with disaster relief protocols.

Figure 2: Five Ways Local Governments Developed Disaster Readiness Capacity in 2019



Source: ICMA's 2019 local government disaster preparedness survey. The survey asked about five main aspects of local disaster preparedness. Local governments reported multiple types related to each aspect of disaster readiness. Thus, the Figure presents the proportion of local governments reporting they have at least one type of a major aspect of disaster preparedness. For example, 95 percent of local governments reported having at least one type of "local fiscal resource" devoted to disaster readiness, such as departmental funds, emergency funds, solid waste funds, insurance, general fund reserves, and/or debt or borrowing.

Finally, an analysis of results from this survey indicates that small, resource-poor governments are less prepared for disasters than larger, wealthier governments. Poor communities of modest populations do not have the resources necessary to adequately engage disaster preparedness strategies. These governments fall behind larger governments in disaster technology capacity, pre-disaster contracting, and mutual aid agreements. Also, when a disaster occurs, smaller governments "do not have the capacity to apply for aid, are not prepared with the data needed that costs out property inventory and assets lost, or even if they do have the data, tallied costs do not reach federal minimal levels to be funded" (Dzigbede, Gehl and Willoughby 2020, 640).

The Role of Local Ordinances in Disaster Management and Resilience

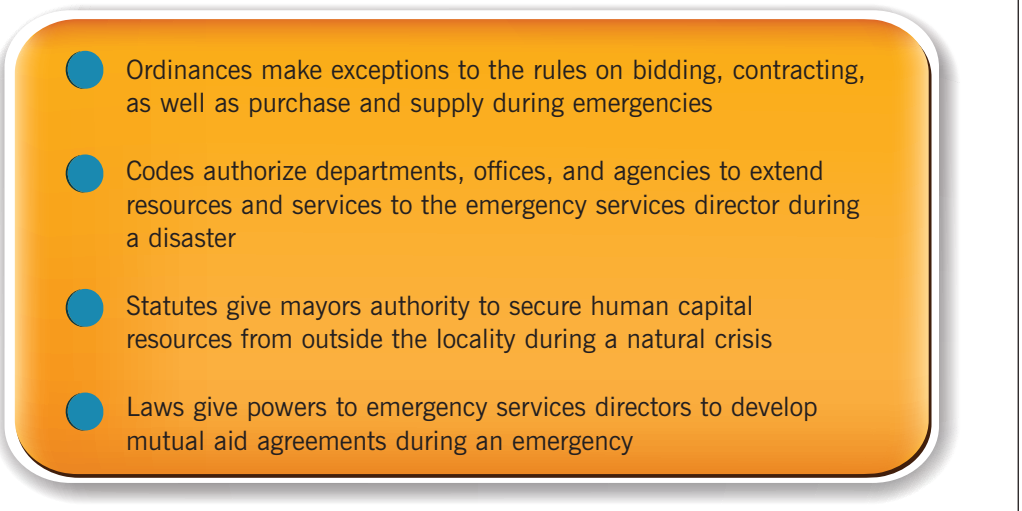
Local ordinances are laws, statutes or decrees enacted by a county, city, town, or village to govern a wide range of matters in the locality, including taxation, spending, zoning, and emergency management (StateScape 2020). These ordinances can provide insights about the legal and institutional context of governments, as well as their ability to respond with flexibility to the non-routine resource needs that might arise during an emergency. Major disasters, when they occur, may require reorganization, repurposing, and repositioning of local resources to respond effectively to the needs of residents (Dzigbede, Gehl and Willoughby 2020). An effective disaster response often requires emergency managers in the local community to make immediate decisions about disaster-related resources; to do so, governance arrangements must allow devolution of decision-making authority in times of crises (Di Francesco and Alford 2016). Thus, local ordinances offer the chance for adaptive enterprise strategy—reconsideration of governing rules to support community response during and after a major disaster.

Examples abound of local governments making provisions in their ordinances to support local disaster readiness needs, revising existing codes regularly, or adopting new ordinances in step with the disaster preparedness goals of a community (see Figure 3).

- In Gulf Shores, Alabama, a city vulnerable to tropical cyclones and hurricanes, code empowers the emergency management director during a major crisis to "represent the mayor on all matters pertaining to emergency management, . . . direct the services of all municipal emergency forces, . . . (and) obtain vital supplies and equipment needed for protection of life and property of people" (City of Gulf Shores 2020, Section 9.4).
- Similarly, a local ordinance of Tuscaloosa, Alabama, authorizes the mayor to secure human capital resources from outside the jurisdiction during an emergency, if the skill or competency required for specific disaster-related functions are not available in the city government (City of Tuscaloosa 2020, Section 9.4).
- In Binghamton, New York, an area prone to major floods, city ordinances give exceptions to the rules on bidding, contracting, and purchase and supply during emergencies, empowering city managers to engage in speedier government business to save lives and property in the event of a catastrophe (City of Binghamton 1970, Section 127.7).
- Also, local ordinances in Louisa County, Virginia, authorize all departments, offices, and agencies to extend resources and services to the emergency services director upon request as needed in the event of a major crisis. Code also empowers the director of emergency services to use the county's resources as much as needed to address local demands when a major disaster hits the community. The director of emergency services may "in collaboration with other public and private agencies, develop or cause to be developed mutual aid agreements for reciprocal assistance in the case of a disaster or emergency" (County of Louisa 2020, Section 30.1).

These selected examples highlight the importance of continually reassessing code, pre-disaster, to adapt provisions so as to strengthen local capacity and support resilience when confronted with disasters. Also, best practices encouraged by FEMA suggest that pre-disaster contracts are less susceptible to fraud, waste, and misuse of funds.

Figure 3: Ways Local Ordinances Support Disaster Management



Note. Many local governments have specific codes and ordinances in place to enhance capacity to manage disastrous events.

Local Officials Share Disaster Management Experiences

The 2019 ICMA disaster readiness survey, reviewed above, provided an overview of fiscal readiness of 901 local governments to address a disaster. The survey delved into the existence of mutual aid contracts, knowledge of protocols for seeking funds, fund availability for disasters, and other measures of preparedness. Additionally, the survey allowed respondents to provide open-ended comments, which more than 100 managers chose to offer. These frontline reflections gave additional insights into the thinking of local government managers on disaster readiness. From frustrations and fear to pride and hope, their comments indicate that local government managers have a variety of experiences and learning to share with the next generation of leaders and those communities that have not yet experienced a major disaster or have struggled to survive one.

To get beneath the surface of these brief comments, we also conducted in depth interviews with 21 of these local government managers, focusing on those who had experienced a federally declared disaster between 2015 and 2019. The interview period spanned June through August 2020 and overlapped with the ongoing pandemic. These managers offered insights and comparisons regarding managing through a weather-related versus a biological natural disaster. What follows includes thematic challenges for local governments as well as lessons learned from experiences managing in the aftermath of natural disasters.

Local Officials Face Three Sets of Challenges

Predominant challenges for local disaster management that were identified spanned infrastructure, management, and finances, with problems among the three often overlapping.

Infrastructure Challenges

Infrastructure surfaced as a particularly vexing problem, for several reasons. Deferred maintenance (a common practice of struggling local governments) means greater vulnerability for systems and potential exacerbation of disaster impacts for residents, businesses, and government facilities. As one manager from a sparsely populated local government explained:

> Infrastructure, for us, is literally crumbling under our feet. . . . We didn't fix our infrastructure for half a century. We are now having to pay for all of that neglect, the bill has come due.
>
> *—City Manager in South Carolina*

Communities with critical infrastructure in flood zones were particularly concerned about their ability to maintain services in the event of a disaster, the need to move or protect that infrastructure, and the revenue and budget implications of both. A manager seeking to shore up water and wastewater infrastructure after a major flood decried:

> The big issue was that it [the flood] totally overwhelmed our critical infrastructure, water and wastewater. It took both plants offline—water for six months, and wastewater, we are still not providing services. As it relates to revenue, you go from selling water to buying water. It killed our budget. In the long term, working with FEMA, we'll recover, but it means getting critical infrastructure out of these locations. I project it will take several years, five to seven years, to build back up a revenue source that can help us cash flow expenses. We went from a positive balance to a negative balance almost instantly.
>
> *—City Administrator in Nebraska*

Isolated communities that rely on "one road in, one road out" scenarios for evacuations found infrastructure to be the greatest source of concern. Finally, lack of communications infrastructure or vulnerable communications infrastructure means a struggle to inform residents. A manager related the experience of an ice storm cutting off electricity for a week, which stymied communications with residents while the public demanded much more information.

Management Challenges

FEMA protocols for funds and reimbursements posed a significant management challenge for many communities.[1] Managers spoke of the burden of tracking expenses and donations, training staff to appreciate the need to track such expenses, and building and maintaining relationships with FEMA as different federal teams cycled through. Additional management challenges included overburdened staff, loss of institutional knowledge due to retirements, inadequate equipment, and responsibility for resident safety, among others. Finally, managers struggle to plan and prepare when their communities are vulnerable to a variety of disasters or the disasters are changing. As one local manager in Iowa put it, "There's always another risk. We have our river flooding, and we feel like we understand that. My biggest fear is that climate change is going to change the impact."

Financial Challenges

Perhaps the greatest challenges financially were making disaster preparation a financial priority before disasters strike and waiting for FEMA reimbursements post-disaster. Managers spoke of fluctuating interest or capacity in own-source disaster funding and multi-year delays in federal funding. According to one:

> Budget restrictions, staffing restrictions, and more, make it very difficult to be able to effectively plan for such situations [disasters]. Cities, such as ours, are barely making it financially, and with staffing reductions the last few budget cycles, it makes it almost impossible to add additional workload on employees. Yet, this is critical for a city to be able to come back from a disaster. Stuck between a rock and a hard place!
>
> *—City Manager in California*

Other financial challenges included lack of reserves, deferred maintenance as noted above, and the inability of small communities to meet the fiscal impacts of disaster or seek (and qualify for) the funds needed.

1. Nimmich (2020) notes that these protocols are mandated by federal law to ensure that FEMA only reimburses local communities for costs related to infrastructure and conditions at the time disaster occurs. Such funding is not for the replacement of infrastructure or other public works in poor condition at the time disaster occurs, having suffered from decades of deferred maintenance.

LOCALITIES AND FEMA: CHALLENGES AND OPPORTUNITES FOLLOWING DISASTER

Local officials provided substantial comment about their interactions with FEMA, most indicating areas for improving connections around immediate disaster management. A majority of these comments regard FEMA protocols when applying for support, wait times for support to arrive, and greater consistency in personnel on site that can reduce the need for repetitive documentation and more work on the part of the locality. Following are excerpts of comments and advice local officials offered to FEMA, based on the authors' interviews and the 2019 ICMA Survey:

- "Thoroughly review and revise FEMA procedures in relation to local government recovery efforts: education, support, funding, etc."

- "Simplify the process of reimbursement. Increase the availability of funding for disaster resiliency. For example, flood mitigation."

- "Our biggest challenge is that we don't get many federally declared disasters because of dollar thresholds that we must meet at the county/state level, and so most incident's recovery costs come out of pocket for us since we are self-insured. I am also concerned by rumors of a federal attempt to have states and local jurisdictions pay a "disaster deductible" before becoming eligible for federal aid. This would make recovery extremely difficult financially for our community."

- "Cut the time to qualify and receive reimbursement funds in half. We are still in the paperwork process for the flood over a year ago. Even with the state managing the process, and I know the state has hired people working across 59 counties. But between the state requirements, which are fairly low level, it's hard to get away from federal bureaucrats. They love paper and to ask inane questions. You can't come up with any more checklists. Block grants to the states and let them handle it."

- "FEMA, everyone on the ground is good people, all of them. But the FEMA system forces them to be bureaucratic box checkers. The bureaucratic process just unnaturally tries to force different scenarios into a standard process, it doesn't work. We are a year and a half post event and really haven't gotten out of the process. Somewhere somebody, some organization cheated and the result is that you must check all boxes. This slows the entire thing down. The other thing in FEMA is that all people are temporary in nature, this group will be with you for six months and then they'll rotate out and a new group rotates in, even though, you provide all this documentation. Over and over again, the documentation has been provided, but they did not read it or lost it. It is set up in a FEMA grants portal, loaded online, but people have to read what is available, that is the frustration."

- "There are way too many people involved in the process of getting a project approved. Both the federal employees and state employees play a role based upon what we supply as local employees. However, the disconnect between those that come out and personally survey a damage site and those that determine whether funding is given has grown so large that those coming out to survey the site are simply documenting conditions and it is a waste of time. We could do this work and submit to FEMA. The recommendations made by these site visit teams are often rejected so I have no idea what the benefit of having them in the process really is. Then a decision whether to fund is made by someone who has never stepped foot in our City."

- "Getting FEMA to agree to pay for storm cleanup takes a long time. We have our public works loaders working 12 hours a day, six days per week to clean up storm debris. Almost two weeks post-storm, we still have another two to three weeks of debris removal to do and just yesterday we got the FEMA OK for storm debris removal reimbursement. Other locations had storm debris removal contractors working the day after the storm but we did not as we do not have the deep pockets that they do so we could not risk

LOCALITIES AND FEMA: CHALLENGES AND OPPORTUNITES FOLLOWING DISASTER (CONT.)

the expense exposure should it not be deemed reimbursable. It would be OUTSTANDING if FEMA would be quicker with this process. We are a city of 27,000."

On the other hand, local officials did offer some useful insights on ways to improve the intergovernmental disaster management system. Most importantly, they pointed to the need for federal liaisons to small communities and stronger, more direct communication between these levels was emphasized. Other comments regard the need for local knowledge of and access to the FEMA portal, and a stronger centralizing role of FEMA vis-à-vis other federal agencies to better coordinate and streamline support down the line.

- "As mentioned before, small cities are generally understaffed. Short of holding our hands, I believe a liaison for each small community would be the most effective. And, [our state's emergency management agency] has done that. FEMA, for the most part has done that as well, but they contract their personnel and the liaison changes, so you basically start over to get the person up to speed. The portals have been a huge improvement and there has been more training on using the portal, processes for submissions, etc. And as I mentioned before, a dashboard or central dissemination of information, to help filter all that information, would be a great benefit. The liaison would need to be well versed on this information as well."

- "The willingness of FEMA especially to partner with local governments and state governments is key. Part of the challenge is when FEMA just wants to deal with the state, and then state deals with FEMA, and the state deals with locals. But you need that direct communication with FEMA, it just takes too long, and too much is lost in translation [without that direct line]. Draw that line as actively between local government and FEMA; it's really important not to delegate to the state. Localities must know what to do. If you are experiencing a natural disaster and looking to clean up and have no experience, you will be in trouble not documenting what you spend money on, not documenting activities. You will not get reimbursed and that means millions that is a tremendous negative consequence on budget."

- "Working with FEMA and [our state's emergency management agency] has been an informative and constructive experience. Three of our four projects have been entered into the federal Grants Portal, and the fourth, a much more extensive one, is beginning now."

- "FEMA offers superior responsiveness and guidance in the initial aftermath. The recovery process is the ultimate in bureaucracy from FEMA. On the other hand, USDA, specifically the Natural Resource Conservation Service (NRCS), eliminated much of the bureaucratic headaches while still maintaining compliance with policy and legal requirements to address the projects and expediting completion all the way to final funding approval and payment."

- "FEMA needs to take the lead and allow other federal agencies to fall under its umbrella. This is the way it used to be. Under the current circumstances, we have to apply to many different sources of federal funds to aggregate the resources necessary to respond. FEMA could be used to centralize this."

Finally, a few local managers had advice to their colleagues on ways to smooth their interactions with FEMA—the most vital, in the words of one official, "DOCUMENT, DOCUMENT! And, if at all possible, document on the recommended forms, in the recommended manner, to prevent duplicating or recreating information." Others cite the need for staff training along with continuous attention to tracking time and activities during disaster recovery "meticulously" to be successful with obtaining financial reimbursements from FEMA for costs incurred.

Four Key Lessons Learned by Local Officials

Small localities are especially vulnerable

One of the most prevalent comments by respondents to the 2019 ICMA disaster preparedness survey was the struggle of managing a small local government through disasters. This squares with results from Dzigbede, Gehl and Willoughby (2020) recalled earlier in their statistical analysis of survey findings—small governments of limited capacity indicate conducting less in terms of fiscal resiliency preparedness efforts than larger governments of greater capacity. Managers of small local governments simply do not have staff capability to plan and prepare for disasters, the equipment to perform debris and damages clean-up, or the staff expertise to seek and receive relief funding. Comments below attest to the fact that small localities must work constantly with their neighboring jurisdictions and regional partners to generate and sustain state and federal relationships to be able to leverage support from these governments in times of disaster.

> I have tried in the past in my small community to come up with plans for emergencies. However, I found templates to be confusing and too specific.
>
> *—City Manager in Iowa*
>
> Small towns have limited resources that have to cover all town services. In this era of increased issues caused by climate change mitigation, there is not enough funding to properly cover what needs to be done. Keeping up with requirements from the state emergency management agency and FEMA is impossible. Many needed programs are not undertaken at all due to limited time and personnel to perform the tasks. Also, trying to get state or federal funding for programs is difficult and time consuming.
>
> *—Emergency Manager in Massachusetts*
>
> Being small, there aren't enough resources (time and money) to spend on a solution.
>
> *—City Administrator in Washington*
>
> We are a very small community of approximately 4,000, therefore we do not have sufficient staff to dedicate to one duty. We all have to do many jobs. We have become much more educated and adept at maneuvering through the minefield of paperwork for disasters and applying for funding to purchase equipment or conduct studies. Which brings me to my favorite subject of entitlement. Some larger cities are handed a check while small cities have to work to be reimbursed. This seems backwards to me as larger cities generally have dedicated staff that can submit paperwork or apply for grants. Also, just my opinion, larger cities waste these funds where smaller cities value the funds and can make these funds go much further. Again, just my opinion!
>
> *—City Manager in Texas*
>
> Living in a small, deprived community we barely get by as it is, financially, just trying to keep the City going is a challenge. We don't have extra funds to be put aside for disasters. After answering these questions, I see we are not prepared for a disaster.
>
> *—City Manager in Michigan*

While most comments from managers of small local governments regarding disaster preparedness—as well as those regarding interactions with FEMA—were pessimistic, some offered insights into their approach to navigating response and recovery efforts successfully despite limitations. They highlighted several strategies:

- Pre-arrange access to county services
- Generate a strong regional approach
- Bolster state liaisons for small communities
- Advance community engagement and communications
- Practice tracking time, activities, and costs thoroughly during disaster recovery
- Promote local knowledge of and access to the FEMA portal and its documentation protocols

In their own words:

> The best practices we have implemented is to be prepared as best we can. Having an emergency tool kit for the department heads loaded with current forms, procedures and whatever else that can be provided ready to grab, has been the most helpful. At our weekly department head meetings, discussing the upcoming hurricane season, for example, reminding everyone of what worked, what didn't last time, what we have accomplished since then, what we have yet to do, just overall brain storming to get everyone into that mindset is very helpful as well. We have learned from past disasters that we must be prepared to help ourselves first. If we get assistance from the county or other agencies, awesome, but it is not guaranteed. Being small presents its challenges, but if we could have ample staff to create shifts for certain job functions during an emergency, that would be one area of improvement which would allow key personnel a chance to rest and recharge. After an event, key personnel are exhausted and drained, much like a marathon runner I expect. We have learned to take advantage of volunteers in some areas, but you have to be cautious that they are capable of handling that particular job function.
>
> *—City Manager in Texas*

> We continually plan and assess needs. In a small community of 8,000, it falls to great community interaction and cooperation to move through the recovery stage. Following the flood of 2011, we took advantage of FEMA mitigation funds to build berms around water and wastewater plants. After struggling to keep plants dry in 2011 flood, in the 2019 flood we simply raised the flood gate, turned on emergency pumping and had to do nothing else. Mitigation plan and project worked perfect.
>
> *—City Administrator in Nebraska*

> "We are a small community so we have a lot of challenges before any disaster strikes, with limited resource and funding sometimes that will slow recovery efforts. But good communication before and after a disaster is the key to successful recovery. Helping your community come together and help each other.
>
> *—City Manager in Georgia*

> We have a very strong regional emergency management group from all disciplines that coordinates, trains, and develops processes for the benefit of the entire region. And as a small city, we naturally utilize interlocal agreements to improve service delivery which also helps with disaster resiliency and recovery.
>
> *—Assistant City Manager in Texas*

The challenges of being a small community are compounded for some localities by isolation and seasonal population fluctuations due to tourism. However, several isolated communities commented on satisfaction with their level of preparedness, claiming knowledge that they will be on their own if disaster strikes. This *preparedness by necessity* raises the question of whether other small communities need to develop the mentality of isolated towns and plan accordingly.

> We are a small community to the north of a large city; however, we are separated by a river and several bridges. In the event of an emergency, we know we will be on our own for several days and perhaps weeks. Therefore, our staff and City Council have made preparing for an emergency a priority. All of our staff are mandatory trained for ICS for their position including all supervisors being trained for ICS400 Incident Command.[2] We have a part-time emergency manager who is developing a CERT team,[3] and addressing needed mutual aid contracts with neighboring communities, nonprofits, and response organizations. We have emergency backup battery pack in City Hall as well as an Emergency generator that can plug in to recharge the battery pack. We have purchased an emergency response trailer and began filling it with all necessary items as suggested by our emergency manager. We have spent this fiscal year very committed to getting our community ready to respond to an emergency. What we have not accomplished is in process.
>
> *—City Administrator in Oregon*

All disasters are local, but many are regional

As mentioned above, small communities find networks key to successful disaster management and this finding applies to large cities and counties, as well. Relationships, partnerships, and networks are multi-faceted: county-city, neighboring jurisdictions, state and federal governments, nonprofits, businesses, and, of course, those with local residents. Local and regional intergovernmental relationships can be both formal and informal. Formal contracts can define roles and set expectations in advance to enhance response and recovery capacity. One manager highlighted the network of formal partnerships that played to strengths:

2. ICS refers to FEMA's Incident Command System, and ICS400 references a FEMA-sanctioned management training course on the Advanced Incident Command System.
3. CERT refers to a Community Emergency Response Team, which is a neighborhood-based team that receives special training to support a response to an emergency or disaster situation

> As the municipalities saw our management practices, we entered into an agreement that the County would take the lead county-wide in the next disaster. This policy change increases the cash flow impact during the next event; however, it can increase the effectiveness of a consolidated approach. Due to the number of shelters at schools and the 'last place of refuge' immediately prior to the event, we entered into an agreement with the schools that we would take the cash flow hit for the management of the shelters and have a consolidated submission for future reimbursement as the school's documentation was not adequate for Hurricane Irma.
>
> *—County Administrator in Florida*

Other communities rely on informal partnerships with neighboring jurisdictions, such as this city's experience:

> We have gotten good support from county officials, county emergency management and county public health. We all know each other. People go to church together and to the same grocery store. So, we expect more of that kind of relationship. The county was quick to set up a disaster management team at one point with three briefings a week. I fostered those relationships when I got here. I have lunch with the county manager once a month. That way, in disaster response, we already know each other. I think it was time well spent. When I got here, I called up my fellow city and county managers and said let's get together for lunch once a month, and if we don't have anything to talk about then we can talk about football. When it came time to collaborate on who is responding, there is already a level of trust. The river cut the county in half and when those two bridges flooded, if you were on the northside, you were staying on the northside. If you were on the southside, you stayed there. Where are we going to park an ambulance on the southside of the river because once it floods, we won't be able to get one there. Those kinds of things are easier with those relationships.
>
> *—City Administrator in Kansas*

Some managers were skeptical of such informal partnerships though, claiming, "Early partnership development with all local government entities by contract exceeds the value of a reference of planned cooperation in the Comprehensive Emergency Management Plans." Or more bluntly, "Don't count on anyone other than those with which you work with regularly in training exercises to be there if you need assistance."

Beyond intergovernmental relationships and networks, local managers emphasized the role of volunteers, nonprofits, businesses, and residents. Volunteers and nonprofits provide utility payment assistance, meals, shelter, debris removal, and medical care. Local governments have built neighbor to neighbor response teams, Community Emergency Response Team training, and Neighborhood Emergency Response Plans to engage residents in preparations and response. Some challenges noted were residents' ability to prepare in the face of poverty, and more generally in the populace, "disaster fatigue" and a lack of awareness of the gravity of threats from disasters. Regarding businesses, one city manager noted that relationships with large businesses were well-established but such relationships with small businesses were harder to develop and maintain. This manager found it hard to understand their interests, but worked to bring aid through grants, loans, and business equipment funds.

In the end, knowledge about partnership possibilities, incentives for engagement, and trust all benefit the solidification of these arrangements pre-disaster to smooth transactions after disaster:

> Part of the challenge is figuring out what resources and what entities and what groups you will depend on no matter what the challenge is. We have established strong relationships with civic groups and nonprofits. When we needed a place for people to shelter, between schools and churches, we had more space than we needed. The school superintendent said, "I have keys to every building." They fed people with their staff and their money. Knowing those resources are there helps lessen the budget burden. I don't have business with the co-op but I know the guy. I know the local construction company owners. I know where to go to ask for things. Having relationships with state emergency management, that has 100,000 sandbags 20 miles away, not having to worry about that. Knowing the resources and having relationships in place.
>
> *—City Administrator in Kansas*

Build plans that the community supports

Plans are ubiquitous, yet local managers stressed the importance of the type of plan, plan currency, and training surrounding any plan. Most local governments (90 percent) responding to the ICMA survey in 2019 reported they have developed, or are developing, hazard mitigation plans. Two-thirds of these governments have developed or are developing continuity of operations plans (66 percent) and over half, standalone disaster recovery plans (58 percent).

In contrast, less than half (47 percent) indicate having developed or currently developing a sustainability or resiliency plan. Local government managers mentioned the need for economic resiliency plans, yet at least one found it difficult to find qualified individuals to construct such plans. Managers noted the importance of plans for shovel-ready projects, particularly for acquiring federal funds as well as plans indicative of community development views. As one manager explained,

> We didn't have a lot of existing plans on how we wanted to develop our community over time. A community could have good community plans to say what you want your community to look like when you rebuild . . . what are you going for? If you have a disaster come through, you can pull those plans out. And if you've engaged your public in buy-in, it would be easier to refine those plans than to start from scratch. They won't fit perfectly, but it is better to refine plans than starting from scratch. Planning matters at the time of a disaster. All the planning you've done in the past counts.
>
> *—Deputy City Manager in Iowa*

While response plans are fairly standard, they need to be constantly updated and discussed or exercised by departments. As one local government manager quipped, "Everyone has plans, and then they sit on the shelf. Even updated ones become outdated quickly." His community, which experiences floods regularly, requires that he update phone lists in plans every year to ensure effective communication with community resources and partners. He noted that it seems small, but in a crisis, those accurate contacts are a golden nugget of efficiency and resource.

We know from the ICMA 2019 survey that training or exercising plans across departments is not as ubiquitous as the plans themselves. An isolated coastal community saw the value in training:

> We are all FEMA, NIMS/Incident Command, and EOC trained.[4] We routinely update our emergency operations plan as a working document, and we frequently conduct training, both in-house and with our state and federal partners. When we train, it involves all city staff including finance. We identify everyone's role in the timeline of events played out in a variety of scenarios.
>
> *—City Manager in Texas*

In addition to training around the plan, maintaining planning as a priority is a considerable challenge. Several local government managers highlighted the waning of interest in disaster planning and preparation after recovery, during lean times, or after retirements and turnover of long-time staff or officials. Additionally, some managers felt that the variety of disasters and uncertainty due to climate change made planning difficult.

Policies can provide emergency powers to procure and spend—in short, the power to act. These policies include hazard pay policies, streamlined purchase order issuance and payment, and fund flexibility.

> Some of this is the outcome of city code and policies developed after the tornado. We have an emergency plan that includes authorization for the mayor to declare an emergency which changes our procurement rules. This authorizes me to purchase up to $15,000 if I determine it is an emergency situation. Those policies gave me the authority I needed to tell my public works guy to go get the pump. Otherwise, I would have been over my spending limit, which would have meant that I would have called a city council meeting to authorize the money.
>
> *—City Administrator in Kansas*

4. NIMS refers to the National Incident Management System operated by FEMA, and EOC refers to the NIMS Emergency Operations Center.

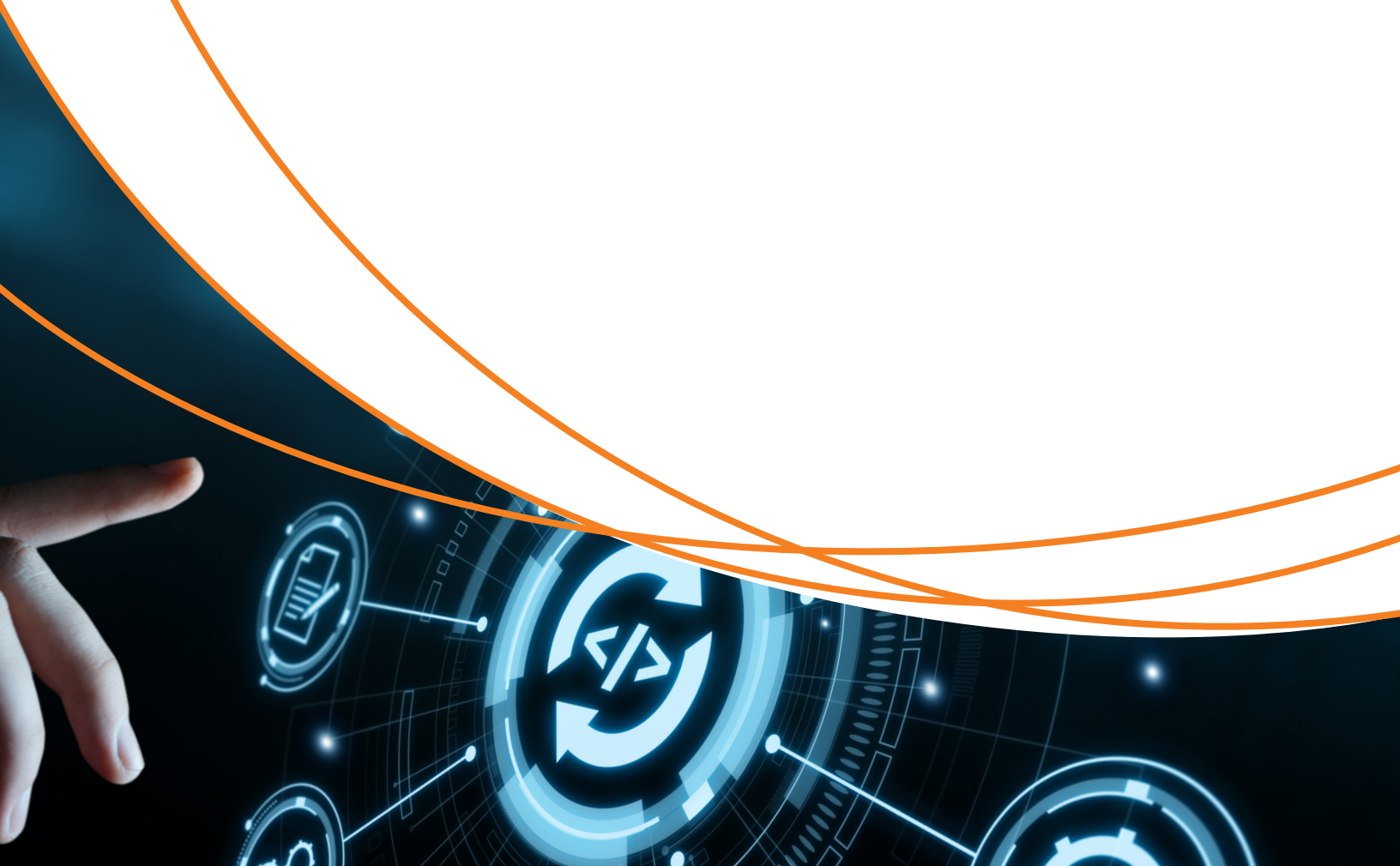
Have a consolidated communication system at the ready

Effective communication following a disastrous event involves multiple mediums, many voices, and diverse audiences. Communications infrastructure was a key challenge identified by local managers, but the questions of communications go beyond infrastructure to the breadth of audiences and mediums that managers must tackle. Local governments must communicate with the public, media outlets, neighboring jurisdictions, state and federal governments, non-profits, and businesses through press conferences, websites, social media, text programs, radio and TV, partner meetings, community meetings, and other avenues. Further, they must be attentive to communications throughout their own organization as departments coordinate functions in disaster response and recovery. One manager recounted the many struggles operationally and politically in disaster communications:

> Communication to the public about the disaster is a challenge as we do not have a local radio or tv station. We rely heavily on social media, which has its own challenges. How to word a press release so as to not cause a panic yet be informative and somewhat instructional. Are we reaching everyone, as not all are on social media? We do have an automated phone message system, but not all residents are registered. Many have eliminated their landlines but have failed to register the mobile devices or update their mobile devices' phone numbers. Politically, sometimes we second guess ourselves because of voter feedback. People are looking for information and some will comment both positive and negatively about the city's activities. Responses may be delayed due to discussions on how and what should be included in the responses or actions may or may not occur because of public perception.
>
> *—City Manager in Texas*

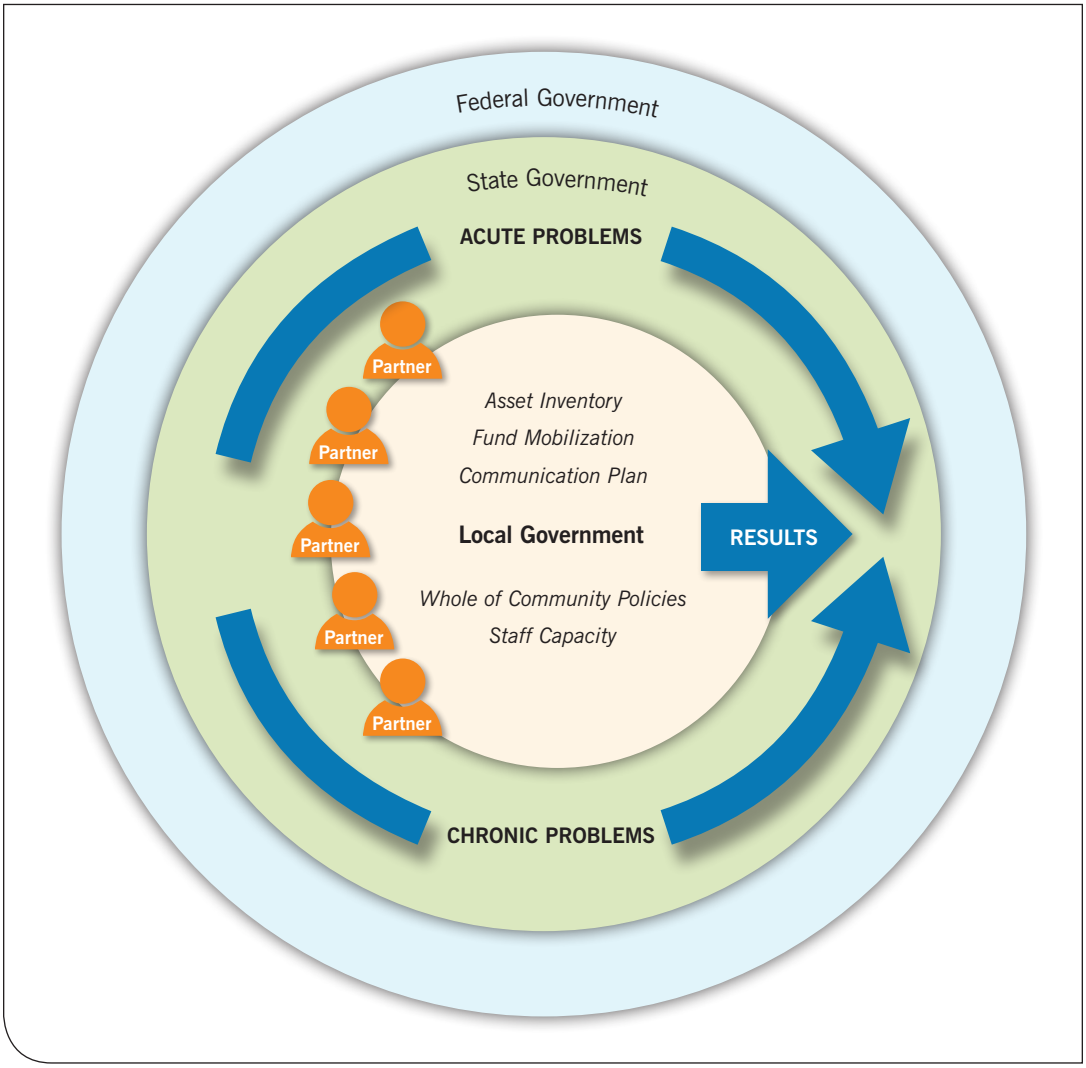
Managers who expressed confidence in their disaster communications cited website overhauls, annual workshops for the community, and neighbor to neighbor outreach programs. They found relationship-building with neighboring jurisdictions again to be valuable in defining communication channels and coordinating messaging and messengers prior to disaster. Additionally, several managers noted the value of a public information officer to centralize communications and handle the level of information desired by the media. In dealing with the deluge of intergovernmental information from other governments and agencies, managers recommended dashboards and central information hubs to reduce the duplicated advisories and requests that can take up valuable time and resources.

Advancing Local Government Resiliency in a Natural Disaster



This research about local government resiliency in times of disaster indicates attention to the framework presented below. This framework recognizes that local governments manage *chronic* problems, such as homelessness, poverty, crime or crumbling infrastructure, among many others, that are difficult to solve and which exacerbate social inequities among resident populations. On top of that, local governments increasingly must manage *acute* problems that manifest as disasters of all sorts.

An Enterprise Framework Is Necessary for Success in Achieving Local Government Resiliency



Within this framework, local governments can deploy a series of enterprise strategies internally to mitigate *acute* disasters while also having an eye on addressing *chronic* problems, in order to achieve resiliency. These strategies include:

Strategy One: Develop a network of horizontal and vertical partners

Externally, local governments must develop and grow a steady network of partners, horizontally and vertically, to manage as successfully as possible through disaster. Horizontal partners include community groups, private businesses, nonprofits, neighboring jurisdictions,

and regional pacts. This network is reciprocal with partners supporting one another to manage disaster recoveries. The result of strong reciprocal partnerships and ongoing network management uplifts all communities when disasters occur and over time has the potential to address local and regional chronic problems, too. Most immediate support for disaster relief will come from a local government's horizontal partners. Nonetheless, local governments must be knowledgeable of and pay attention to their vertical relationships up the chain of government with their state and the federal governments. Local government "boots on the ground" means that state and especially federal assistance, can be many hours and days, even weeks or months away. Asking for this support after disaster, however, must occur immediately and so, local governments must be prepared to make those asks by understanding necessary protocols and with the information, calculations, and knowledge to explain and justify claims.

It is essential that local officials and emergency managers generate close relationships with their state and federal counterparts. In fact, our results indicate that local governments, especially small ones, recognize gaps in their relationship with FEMA in times of disaster, but see progress (via revisions to the FEMA grants portal)[5] and suggest innovations that can help to close these gaps. Most importantly, the federal-local link must be strengthened, especially with smaller localities, in order to smooth the flow of communications, documentation, and support. Also, smaller localities should continually nurture horizontal relationships—banding together with their local businesses, nonprofits, neighboring jurisdictions and regional partners—as a way to strengthen the vertical ones, between localities, states, and the federal government when disaster strikes. As we heard time and time again from local officials, getting to know those you are seeking support from only after a disaster occurs is detrimental to an effective recovery process.

Strategy Two: Develop policies using a whole of community approach

Local government policy making regarding programming and service delivery as well as public desired and expected growth and development should engage a whole of community approach. That is, local governments must work continually with their communities to understand needs, unique challenges, as well as volunteer and other support that can be contributed by these groups when disaster strikes. Ideally, local officials are consistently listening to their public, local business, and nonprofit partners regarding growth and development to incorporate these views into strategic plans. If so, disaster recovery efforts can coalesce with plans that communities have already bought into and support.

Strategy Three: Maintain a current inventory of assets

Local governments must maintain an updated accounting of assets along with estimates of costs that might be expected if they need to be replaced following all sorts of disasters that can be imagined. These inventories, estimates, and calculations must be available before and accessible after disaster strikes. This information cannot be collected well, if at all, following a disaster and much of it is necessary to be able to request relief funding from other governments and entities.

Strategy Four: Understand in advance the financial options available

Local governments must constantly reassess fiscal options in times of disaster. This regards not only understanding the government's current revenue capacity, but also the facility with which grant applications can be made, emergency spending can be conducted, and fiscal

5. The FEMA grants portal for governments and nonprofits to tally costs and apply for assistance can be accessed at: https://grantee.fema.gov/

management pivots can be initiated. Developing fiscal options is just as crucial as developing staff capacity—both need to be assessed and addressed constantly. This starts by taking advantage of the wealth of emergency management training provided by federal and state governments as well as knowledge-building resources from relevant professional organizations.

Strategy Five: Jointly train and conduct exercises

Public officials should avail themselves of the cornucopia of relevant training and resources regarding disaster and emergency management available from professional associations and government agencies. These officials should periodically check that their managers and staff are exposed as well and encourage continual learning. A culture of preparedness requires that local managers are all-inclusive in engaging their staff and their other horizontal partners in these education and skill-building endeavors.[6]

Strategy Six: Develop a public communication plan in advance

Local governments must have a well thought out communications plan that provides consistent, fact-based messaging to the public throughout disastrous events. Communications must be of one voice, though conducted by many, with attention to the roles of various actors as well as the diversity of the community. For instance, in times of crisis, mayors can provide much needed reassurance, hope, and calm, communications officers can monitor and manage various media outlets and flow, and managers can provide directive guidance for advancing well through recovery. Communication delivery to diverse groups requires attention to language and phrasing to be most effective.

Conclusion

This enterprise framework involves numerous stakeholders and associated strategies that should provide local governments greater clarity on actors, roles and responsibilities at every level, and engagement strategies to include nonprofits, the private sector, media, and the public for long term fiscal resilience and sustainable economic development. Our model builds on FEMA's actions and strategies for disaster recovery, generally, but are more specific as to ways localities can better prepare to foster resiliency and support, even bolster, economic development following disaster. Local governments have a tough road in the aftermath of a weather-related natural disaster, and for small, low capacity governments, this road is ever more perilous. In fact, many sparsely populated local governments of limited capacity around the nation are just one disaster away from extinction.

Undoubtedly, learning occurs during and following each disaster. Local officials can become adept at engaging and adapting these various strategies in anticipation of subsequent disasters. Also, the mix of strategies most useful to managing through any specific disaster is likely to change. Remaining open and flexible to these required pivots in strategy engagement is another skill that local officials, managers, and staff must build and become comfortable with. Such an enterprise approach to disaster management serves to reduce possible losses—of people, property, and finances—in the event of a catastrophic event, inching the alert and proactive local government toward resiliency.

6. FEMA has developed a web-based portal that offers community preparedness briefs, events, and the opportunity to create a community among disaster preparedness officials to share insights and experiences. It may be accessed at: https://community.fema.gov/AP_Login

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