Private-Public Sector Collaboration to Enhance Community Disaster Resilience: A Workshop Report

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PRIVATE-PUBLIC SECTOR COLLABORATION TO ENHANCE COMMUNITY DISASTER RESILIENCE

A WORKSHOP REPORT

Committee on Private-Public Sector Collaboration to Enhance
Community Disaster Resilience

Geographical Science Committee

Board on Earth Sciences and Resources

Division on Earth and Life Studies

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This workshop report is dedicated to the memory of **Frank Reddish**, a long-time leader in natural disaster and recovery. Through years of committed and focused effort, Mr. Reddish made Miami-Dade County and the state of Florida a safer and more resilient place to live. His work drew attention and had impact both locally and nationwide. He contributed powerfully to this workshop, held September 9-10, 2009, and his work will continue to have a positive impact for years to come.

Acknowledgments

In response to a request by the Department of Homeland Security (DHS), the National Research Council formed an ad hoc committee to assess the current state of the art in private-public sector collaboration dedicated to strengthening community disaster resilience, to identify gaps in knowledge and practice, and to recommend research areas that could be targeted for research investment by the Human Factors Division of the Department of Homeland Security. The committee's charge included organizing a 2-day workshop to explore relevant issues and inform the study committee's final recommendations. The workshop was held September 9-10, 2009, in Arlington, Virginia, and engaged a group of approximately 60 participants representing, from different regions of the country, individuals from the private and public sectors and from the research community.

For providing excellent workshop presentations intended to orient attendees regarding the subject matter to be discussed, the National Research Council would like to thank Arif Alikhan, DHS, and Emily Walker, Member of the National Commission on Terrorist Attacks upon the United States. Also to be acknowledged are those who served as panelists for workshop discussions including: Ron Carlee, Arlington County, Virginia; Jami Haberl, Safeguard Iowa Partnership; Stephen Jordan, U.S. Chamber of Commerce; Leslie Luke, County of San Diego Office of Emergency Services; Gene Matthews, University of North Carolina; Governor Scott McCallum (Wisconsin, 2001-2003), The Aidmatrix Foundation, Inc.; Jason McNamara, Federal Emergency Management Agency; Jim Mullen, Washington State Emergency Management Division; Mickie Valente, Valente Strategic Advisers, LLC; Maria Vorel, Federal Emergency Management Agency; Brit Weber, Michigan State University; Mary Wong, Office Depot Foundation. The workshop would not have been successful without the contributions of those who attended. All participants are listed in Appendix B of this document.

This workshop report has been reviewed in draft form by persons chosen for their diverse perspectives and technical expertise in accordance with procedures approved by the National Research Council's Report Review Committee. The purposes of this review are to provide candid and critical comments that will assist the institution in making the published report as sound as possible and to ensure that the report meets institutional standards of objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following for their participation in the review of this report:

Ann Patton, Founding Director (Retired), Tulsa Partners Inc.
Gregory Shaw, Associate Professor of Engineering Management and Systems Engineering Co-Director, The George Washington University
Mickie Valente, President, Valente Strategic Advisers, LLC
Tom Wilbanks, Group Leader, Global Change and Developing Countries Programs, Oak Ridge National Laboratory

Although the reviewers listed above have provided many constructive comments and suggestions, they were not asked to endorse, nor did they see, the final draft of the workshop report before its release. The review of this report was overseen by Dr. Susan Cutter, University of South Carolina. Appointed by the Division on Earth and Life Studies, she was responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring committee and the National Research Council.

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Summary

PURPOSE OF THE WORKSHOP

The terrorist attacks of September 11, 2001 (9/11) on the United States prompted a rethinking of how the United States prepares for disasters. Federal policy documents written since 9/11 have stressed that the private and public sectors share equal responsibility for the security of the nation's critical infrastructure and key assets. Private sector entities have a role in the safety, security, and resilience of the communities in which they operate. Incentivizing the private sector to expend resources on community efforts remains challenging. Disasters in the United States since 9/11 (e.g., Hurricane Katrina in 2005) indicate that the nation has not yet been successful in making its communities resilient to disaster.

The National Research Council (NRC) at the request of the Department of Homeland Security formed an ad hoc committee to assess the current states of the art and practice in private-public sector collaboration dedicated to strengthening community disaster resilience. The committee's charge included organizing a public workshop to explore the following issues:

- Current efforts at the regional, state and community levels to develop private-public partnerships for the purpose of developing and enhancing community preparedness and resilience;
- Motivators, inhibitors, advantages and liabilities for private sector engagement in private-public sector cooperation in planning, resource allocation and preparedness for natural and man-made hazards;
- Distinctions in perceptions or motivations between large national-level corporations and the small business community that might influence the formation of private-public sector partnerships, particularly in smaller or rural communities;
- Gaps in current knowledge and practice in private-public sector partnerships that inhibit the ability to develop collaboration across sectors;
- Research areas that could bridge these gaps; and
- Design, development and implementation of collaborative endeavors for the

purpose of strengthening the resilience of communities to natural and man-made hazards.

The committee held a 2-day workshop in Washington, DC on September 9-10, 2009. Through presentations and facilitated discussion among approximately 60 invited participants, issues related to the development of collaborations were explored. The objective of the workshop was not to determine what the goals of collaborations should be, nor was it to consider the respective roles of the private or public sectors in disaster preparedness and response. The workshop was designed to inform the NRC study committee of the characteristics of successful and enduring collaborations, and to identify elements of the cultural environment necessary for such collaborations to form and thrive. The workshop agenda was purposely organized to avoid the emotion that often accompanies discussion of past disaster response failures so that objective discussion could be focused on issues of collaboration.

Workshop participants included researchers, community organizers, representatives from business, nongovernment- and nonprofit organizations, and emergency management practitioners and leaders at the local, state, and federal levels. Individuals studying, participating in, or facilitating private-public sector collaborations in different parts of the country were invited to attend. Participants had expertise in natural disasters and science policy, disaster preparedness, crisis and risk management, disaster response, economics, public health, and other areas relevant to the discussion. Different regional perspectives were also sought.

The committee sought to understand how a community benefits from broad, resilience-focused collaboration and wanted to learn what was essential for community members to build resilience and improve disaster preparedness and recovery. A workshop goal was to understand how supporting this type of collaboration could be made a national priority.

The workshop was organized around three major themes: (1) facilitating factors and barriers to the formation of collaborations for building community resilience; (2) identification of the characteristics of effective, robust, and sustainable private-public sector collaboration at the local and state levels; and (3) encouragement of widespread development of private-public sector collaboration for enhancing community resilience.

WORKSHOP REPORT

This workshop report is the first of two reports to be prepared by the study committee. It organizes major ideas expressed during the workshop into common themes. As such, it is not a comprehensive summary of all relevant topics and issues. Viewpoints expressed in this report do not necessarily represent consensus of workshop participants, the views of the NRC study committee, the NRC, or the sponsor.

This report does not contain conclusions and recommendations. The committee will present its conclusions and recommendations in its final report.

WORKSHOP CONCEPTS

Disaster Resilience as Part of Community Resilience

Community resilience, in general terms, speaks to the continued ability of a community to function during and following stress. Building and maintaining resilience depend on the ability of a community to monitor change and appropriately modify plans and activities to accommodate observed changes. Implicit in the report discussion of building community disaster resilience is that all sectors of a community can and are obligated to participate in all phases of disaster preparedness, mitigation, response, and recovery.

Building resilience, according to workshop participants, involves community planning at every level, and involves more than just planning for disaster. Communities most likely to survive disaster are those committed to building a sense of community, those that are actively committed to social equity and inclusion, those that are economically and environmentally sustainable, and those that create a vision to which its residents and institutions can relate. Resilient communities are those that continuously work toward resilience, regardless of whether a disaster is likely to occur. Extensive collaboration, trust, respect, partnering, and cross-networking allow a community to define and develop the qualities that make it resilient.

According to many workshop participants, communities are more likely to undertake mitigation and resilience-building efforts if the benefits of doing so are translated into terms that reflect general economic development and gain. Benefits of resilience accrue daily. Resilient businesses, for example, may be more inclined to display stronger business integrity during normal operation, and are more likely to remain open or reopen more quickly following a disaster, helping to keep the local economy functioning. Similarly, resilient nongovernment and faith-based organizations may be better able to provide services to their constituents following a disaster.

Many workshop participants stated that command-and-control mechanisms are not conducive to engaging all members of the community and to building community-level resilience. They noted that private-public sector collaboration could be an ideal model for building grassroots-based collaborative efforts for all phases of collaboration and disaster preparedness and response. Such efforts are more likely to succeed if established at the local level with a bottom-up, locally relevant approach. Building a nation of resilient communities, however, is largely dependent on the facilitating, but nonprescriptive, support of higher levels of government.

Characteristics of Successful Collaboration

Motivation, trust, some form of leadership, and a common mission that drives the purpose and structure of the collaboration are considered essential for successful collaboration building. Mechanisms by which partnerships are developed and sustained may vary, but collaborations are more likely to succeed at building community resilience

if all community stakeholders are included in the collaborative efforts. It was emphasized that trusted relationships are the essential capital that drive resilience.

Working through a collaborative infrastructure may make it more likely that actions taken will best serve the interests of the community. Some workshop participants praised the volunteer efforts of individuals and groups that spontaneously respond to disasters, but noted their actions may not always be in the best interest of the community. Determining how to harness the energy of these volunteers and engage them in productive collaborative approaches could be beneficial.

No single science of collaboration exists, although collaboration theory is studied and applied in a variety of disciplines. There are numerous collaboration models that can be applied by communities under different circumstances, and extensive social sciences and public health literature exists from which to draw. The literature has been applied in alternative dispute resolution, in techniques utilized by land-use planners, and by negotiators.

Creating Successful Private-Public Collaboration

Workshop participants were presented with a suggested protocol for the development of private-public collaboration developed at the Michigan State University. Similarities were noted between this protocol and other collaboration-forming processes also described at the workshop. The protocol developed at Michigan State University includes the six steps listed below.

1. Identify public and private sector stakeholders to share leadership (some workshop participants described how members of the community may respond better to leadership representing their own sector; others indicated that shared leadership was not essential).
2. Identify and engage individual networks to be included in the collaboration.
3. Identify common issues among collaborators related to emergency preparedness.
4. Identify new resources within the community to mitigate the impact of critical incidents.
5. Identify challenges encountered by participating organizations, such as risks and threats caused by natural or human-caused disasters that threaten participating organizations individually or collectively.
6. Create sustainability in the collaboration by determining collective needs, defining goals that provide direction, assigning performance tasks based on who does what best, and by working collaboratively.

Many workshop participants noted that programmatic and relationship sustainability, rather than the longevity of programs, are key measures of the sustainability of a partnership. Some Project Impact communities were cited as examples of sustainable collaborations—relationships were maintained even after program funding ended. Networks are more likely to be sustainable when mission-driving concepts are institutionalized throughout the network. Sustainable funding, local and regional support,

successful communication strategies, and an effective marketing plan were all cited as essential to effective and sustainable collaborations.

Leadership

Sustainable partnerships were considered by many to be dependent on strong leadership able to promote a clear vision embraced by all. Different leadership models may be successfully applied depending on the dynamics and needs of a community. Some successful models are based on sharing of leadership as mentioned above, and others are based on leadership primarily from the public sector. Workshop participants learned that leadership may come from elsewhere, such as the scientific community, exemplifying how different approaches can be successful.

Regardless of the leadership model employed, flexibility and responsiveness were cited by many as essential qualities. Leadership may evolve from one model to another in response to changes in the network or in the larger community. Institutionalizing a vision makes the collaboration more likely to be sustained even after succession of dynamic leadership.

Scalability

Scalability is the ability of an organization or technology to accept volume changes without impacting effectiveness. Scalability in collaboration implies an ability to expand functionality to handle larger or smaller situations; to include a greater or smaller number of people or organizations as warranted; or to apply functionalities of the collaboration to meet new objectives. Partnerships established on networks of relationships are inherently more scalable than hierarchical organizations that require single-path processing. The definition of scalability could also include the ability to translate a process from one population to another. Some participants described how collaboration-building processes may be made scalable by describing the different ways in which private-public sector collaborations can be formed. Other workshop participants remarked how the scaling down of processes can be more difficult than scaling up, especially for rural communities with few or scattered resources. Business growth models may offer insights regarding the scalability of partnerships and the capital requirement components of different types of scalability.

BARRIERS

During market equilibrium, when not influenced by disaster, a certain amount of need exists, as does the capacity to fill those needs. However, when a disaster strikes, demand for essential resources may escalate while the ability to meet demand declines. Many workshop participants described how private-public sector collaboration may be a means to identify the supply chains critical for maintaining market equilibrium following a disaster. Emergency response could be coordinated more efficiently, and disruptions to

market equilibrium and social stability minimized. However, numerous barriers to collaboration exist—the social, political, and economic environments of our nation are often not supportive of collaborative efforts.

Jurisdictional Challenges

Disasters do not respect jurisdictional boundaries and it is difficult to reconcile economic, social, environmental, and political spaces when disaster crosses boundaries. The responsibilities and liabilities of local, state, and federal levels of government are not clear. Communication and trust between different levels of government, and even between agencies at the same level of government, were identified as barriers to effective collaboration and were blamed for problems ranging from minor inefficiencies to major gaps in emergency response. Additionally, the tendency to place organizations of all kinds—government, nonprofit, and private—into organizational silos can create a competitive rather than cooperative environment. Incompatible or duplicated efforts often result.

Fear of Additional Oversight

Organizations may already be overwhelmed by government programs, regulations, and mandates. The fear of additional government oversight was described by some workshop participants as a deterrent to private sector participation in private-public sector collaboration. This was also recognized as a potential deterrent to participation by nongovernmental, community, and faith-based organizations.

Liability Issues

Liability concerns may create disincentives for engagement in private-public sector collaboration. Good Samaritan laws that safeguard individuals who inadvertently do harm when acting in good faith during emergencies are often not applicable to organizations. Confusion regarding liability laws was described as a major impediment to private sector engagement in resilience-building efforts. For example, liability laws may differ between the different jurisdictions in which a business may operate. Memoranda of understanding (MOU) established between local jurisdictions and private organizations may compete or conflict with state-level MOU. Confusion regarding how liability is covered may result, and coordination efforts may be negatively impacted.

Language Barriers

The language of resilience is often translated poorly to different audiences, and a lack of shared understanding of concepts and terminology can be a barrier to effective communication. A lack of common language, even among those who seek similar

outcomes, may make collaboration difficult. For example, the business sector may not effectively communicate with nonprofit or faith-based organizations, or with other private industries. The public sector may not communicate well with the private sector. Finding a common language presents a major challenge, but many participants stated that avoiding language steeped in military vernacular may be more conducive to ground-up building of collaboration at the community level. Establishing good communication is best done, according to many participants, prior to testing the strength of collaboration. Lack of good communication could cause a disintegration of collaboration when stressed by disaster.

Trust

Lack of trust is a primary barrier to effective network-building efforts, according to many workshop participants. Trust changes with time and circumstances, and strategy and creativity are needed to create and sustain trust. A single formula may not be universally applicable to all communities or even to a single community over time. Sustaining trust through change is a greater challenge. A general lack of understanding about human factors such as trust prevent the most effective use of technologies, methodologies, or strategies for building community resilience.

Resource Challenges

Sustainable funding was described by multiple workshop participants as another primary barrier to forming and sustaining private-public collaborations. Funding sources are often short-lived and limited, though resilience building is a long-term process. Long-term approaches are difficult to fund because thinking in the long term is, in itself, not acknowledged by funding agencies as a critical aspect of program delivery. Few funding programs appreciate the success of processes such as collaboration, partnership development, and public education. Benchmarks are not readily available to justify resource requests for these types of expenditures.

Many participants noted that funding is often tied to threat-based initiatives, limiting resources available for more general efforts such as building community resilience. Inflexibility of grants, the requirement of matching funds, and the confusing and time-consuming administration of public grants were also described as problematic. Some workshop participants noted hesitancy from the private sector to contribute to collaborative endeavors when it was perceived that the public sector was not contributing in significant ways. Required cost sharing by communities as a prerequisite to the acquisition of public funding may be a major obstacle for rural and other communities with limited resources to obtain money for resilience-building efforts.

Lack of Inclusiveness

Disenfranchised Community Members

Some workshop participants noted that resilience-building efforts may fail, in part because of a focus on generic populations (e.g., middle class, educated suburban dwellers) rather than on the full fabric of the community. For example, government organizations may not have plans in place to serve those who live in perpetual states of disaster because of poverty, crime, and violence. Minority groups and non-English speakers may similarly be overlooked. Rather than thinking of such citizens as drains on resources, these populations could be embraced as positive assets because of their extensive experience dealing with disaster on a daily basis. Several workshop participants considered it essential to integrate disenfranchised members of the community into collaborative efforts. Collaborative processes can empower all members of the community to be decision makers for the community.

Community and Faith-Based Organizations

Effectively engaging community- and faith-based organizations in private-public sector collaborations is an organizational challenge. In the wake of a disaster, community- and faith-based organizations are often the first to provide food, shelter, medical, hygiene, and other support services. They independently identify and fill gaps in services not otherwise provided. Yet these groups are often not engaged in collaborative efforts because they do not readily fit into the organizational silos into which other organizations are divided. A lack of knowledge of the community and faith-based groups operating in a community, their respective goals and capacities, and the ways in which the mutual interests of the organizations and the larger community may coincide are barriers to effective engagement.

RESEARCH THEMES AND TOOLS

A Repository of Best Practices and Lessons Learned

The need for a freely accessible repository of knowledge, best practices, lessons learned at the community level, and subject matter expertise—managed by a neutral party representing the best interests of all stakeholders—was repeatedly expressed during the workshop. It was also expressed that the Federal Emergency Management Agency or another funding agency might not be effective as the neutral-party manager of the repository. Exploration of possible mechanisms for how this repository could function would be useful. Tools and templates that encourage and assist in community preparedness and response by describing actionable, understandable, and scalable methodologies for given situations could be part of the repository, as could time-series

analyses, and other pertinent data and research results, all in readily accessible and searchable formats.

Metrics

Many workshop participants noted a lack of a politically acceptable, evidenced-based, nonprescriptive framework that helps communities build resilience. However many also noted that few measures of resilience exist that can aid in establishing objectives and measuring success. Bases of information from which to draw are not available from which to gauge progress.

Participants described the need for metrics to quantify the benefits of collaboration and resilience-building efforts. Metrics are important from the scientific and practical points of view, for example in determining the most effective methodologies under given circumstances, or for justifying that grant dollars are well spent. Metrics that quantify success could be useful for mobilizing private sector participation and investment in collaborative efforts. Several types of metrics were identified as vital, including those to evaluate partnerships themselves, and those to measure the resilience of communities more generally.

Evaluating Partnerships

Certain aspects of collaboration are difficult to measure, such as trust generated between network members, or how well goals of collaboration are institutionalized. Research on the social measures most indicative of successful collaboration, as well as the development of tools for their measure, could be of benefit. The pubic health community has some mechanisms in place for evaluating effectiveness of partnerships. Exploring research conducted within other disciplines could prove useful.

Evaluating Community-Level Resilience

Aspects of resilience building associated with physical infrastructure can be relatively straightforward to measure. Measuring the sociological benefits acquired as a result of resilience-building efforts, such as those related to public education and cultural and attitude shifts, is less straightforward. Research to quantify these “soft tissue” changes, such as social network analysis, could be useful. Research by government agencies on measuring different aspects of resilience was cited. A survey of research conducted by, for example, the Economic Development Administration of the Department of Commerce, the United States Department of Agriculture, and other government agencies at all levels, could identify applications already in use or in development. A survey of this sort could allow more efficient use of resources and more coordinated efforts toward achieving common goals.

A Base of Information

Partnership Models

Case studies of effective partnerships could be part of the means of establishing a base of information considered essential for measuring progress of collaborative efforts. Longitudinal studies to understand how partnerships function or are sustainable under different circumstances could be a means of creating a body of best practices. Comparison studies of partnerships and their infrastructures could identify factors critical to sustainable efforts. Research on effective collaboration models within government, the private sector, and in private-public sector collaboration, as well as the economic impacts of the various approaches, were also described as important.

Community Infrastructures

A more holistic approach to resilience building was described as necessary by many workshop participants, and research to understand existing networks in a community could provide an important part of the information considered necessary for such an approach. Understanding how community education, public health, workplace, transportation, and communications systems work and can fit together could lead to ending the practice of categorizing organizations into independently functioning silos. Research findings could help community managers and organizers more efficiently identify common goals among organizations and, in turn, to develop a single community infrastructure that unifies community networks.

Time-Series Studies

Because how a community responds to stress may change as a community changes, assessing regional resilience levels over time could be beneficial. Determining the means to monitor a community's ability to respond to disasters was considered an essential research topic by many workshop participants. Once a disaster occurs, time-series research on recovery—for example 10, 15, and 20 years following an event—could help quantify the long-term losses of all sectors in the community. This could be true not only for those communities directly affected by the disaster, but for those communities facing secondary impacts such as the influx of disaster evacuees. Such data could be useful for recovery effectiveness methodology modeling.

Incentivizing Participation

Community-Level Involvement

Research on how best to integrate community- and faith-based organizations and underserved populations into collaborative resilience-building efforts could empower such groups to operate most efficiently for the benefit of themselves and the community as a whole. Research on how different peer groups can be incentivized, including on how partnership agendas can be reframed to be more inclusive, may help engage these important but often overlooked community stakeholders.

Business Involvement

Business-sector involvement in private-public sector partnerships is motivated by an understanding of the benefits of participation, the desire to maintain positive public perception, and concerns about liability. Because businesses are in business to make money, the profits associated with collaborative efforts could be highlighted to those reluctant to expend their resources. Many in the private sector, however, recognize the benefits of active participation in resilience-building collaborations—that what is good for the larger community is also good for individual businesses. However, workshop participants did not agree on a form of engagement.

Some workshop discussion focused on the language and methods useful for incentivizing business executives to participate in resilience-building collaborations. The development of a business prospectus that identifies potential operating models for collaboration was suggested. The great diversity within the business sector, such as between commercial sales firms, service industries, media, utilities, and financial and insurance institutions, differ in purpose, character, and style, and may require different incentivizing approaches. Research regarding different operating and economic models, and on the most sustainable and scalable models for the business community, were considered important by some. Equally important to some participants was research on the human factor issues that could be incorporated into the various models.

Behavioral Studies

Many questions were raised by workshop participants regarding the behavior of individuals and collaborations when under stress, including emergent behaviors. Answers to these questions could inform predictive behavioral models. Understanding and predicting motivators to certain behaviors could help planners target communication, planning, and emergency response activities.

Capacity Building

Resilience building was considered by workshop participants to be largely dependent on the ability of communities to provide technical training, assistance, and outreach. Many questions were raised about the form training should take as well as who should implement the training. Research on the kinds of training essential to build leadership qualities among individuals, on how collaboration skill sets are built at the community level, and on how creativity and innovation can be fostered within collaborations (e.g., by tapping into communication technologies embraced by younger generations) could all be informative.

Many workshop participants stated that the concept of resilience could be incorporated into curricula at institutions of higher learning in order to realize cultural shifts in thinking they considered integral to successful resilience-building efforts among the next generation of business leaders, public managers, and managers of nongovernmental organizations. Peer mentoring—where community members assisting other communities—are a potential means of reaching individuals already in leadership positions. Evaluation of the effectiveness of such programs could provide information to make these and similar programs more effective in the future.

FUNDING RESEARCH

A new type of funding stream to support the applied research necessary on how to build collaborations for resilient communities was considered essential by many workshop participants. Funds are more often available for development of technologies that support resilience, but, according to many participants, sustainable funding is not readily available to study the human factors that allow the technologies to be driven successfully. Incorporating research directly into funding for collaborative activities could foster interaction between researchers and practitioners, provide a laboratory for researchers, and potentially provide real-time information needed by practitioners to best modify goals, objectives, and activities.

A NATIONAL AGENDA

To become a nation of resilient communities, many workshop participants considered it essential to create an environment that promotes collaborative resilience-building efforts. The need was identified by some to move from a system focused on response to disasters, to a framework that is informed and guided by the general principles of resilience building. To do so, it is essential to establish the building of community resilience as a true national priority across all agencies. Goals would be clearly stated and accepted and institutionalized at the national level. This could create a focus on the issue that has not existed before.

1

Introduction

Rigorous and coordinated disaster preparedness planning is often thwarted because of a lack of shared understanding and agreement on common goals as well as situational awareness among community leaders who link economic, cultural, social, and political sectors constituting the strength of the nation's civic infrastructure. Although a majority of the nation's critical infrastructure is owned and operated by the private sector, there has been limited collaborative engagement between the public and private sectors for the purpose of improving community-level resilience and disaster preparedness. The public sector often does not capitalize on the experience and expertise resident in the nation's private sector.

Since the terrorist attacks on the United States on September 11, 2001 (9/11), numerous federal policy documents have stressed that the private sector shares equal responsibility with government for the security of the nation's critical infrastructure and key assets. In 2008, the National Response Framework[1] (NRF) made explicit that private sector entities have a role in the safety, security, and resilience of communities in which they operate. Implicit in this concept is an assumption that the degree of security and resilience attained in a community will be a function of the level of coordination and involvement between local government, response agencies, and the private sector. Indeed, the NRF states that "during an incident, key private sector business partners should be involved in the local crisis decision-making process or at least have a direct link to key local emergency managers. Communities cannot effectively respond to, or recover from, incidents without strong cooperative relations with the private sector" (U.S. Department of Homeland Security, 2008).

The Human Factors Division of the Department of Homeland Security (DHS) Science and Technology Directorate applies the social and behavioral sciences to support the preparedness, response, and recovery of communities affected by catastrophic events. The goal of the division is to advance homeland security planning and technology development through consideration of human factors. DHS contracted with the National

[1] See www.fema.gov/emergency/nrf/ (accessed January 15, 2010). Other examples that address the role of the private sector include the National Incident Management System, available at www.fema.gov/emergency/nims/, and the National Infrastructure Protection Plan, available at www.dhs.gov/files/programs/editorial_0827.shtm (accessed January 15, 2010).

Research Council (NRC) to assess the current state of the art in private-public sector collaboration dedicated to strengthening community resilience, identify gaps in knowledge and practice, an recommend research areas that could be targeted for research investment by the DHS Human Factors Division. To address this charge, NRC formed an ad hoc committee under the auspices of the Geographical Sciences Committee of the Board on Earth Sciences and Resources. The committee's statement of task is provided in Box 1-1. Part of its charge was to plan and organize a 2-day data-gathering workshop, conducted September 9-10, 2009 in Washington, D.C. The workshop emphasized expert panel presentations on topics related to the committee objectives along with interactive plenary and small group sessions (see agenda, Box 1-2). Panels focused on why collaborative approaches to resilience planning should become a national priority, characteristics of sustainable state- and local-level collaborative models, and the roles of state and local government in building community resilience. Presentations addressed the DHS voluntary private sector preparedness accreditation and certificate program, and the critical importance of community and cross-sector partnerships.

BOX 1-1
Statement of Task

An ad hoc committee will assess the current state of the art in private-public sector partnerships dedicated to strengthening community resilience, identify gaps in knowledge and practice, and recommend research areas that could be targeted for research investment by the DHS Human Factors Division. In its final report, the committee will:

- Identify the components of a framework for private-public sector partnerships dedicated to strengthening community resilience;
- Develop a set of guidelines for private sector engagement in the development of a framework for enhancing community resilience; and
- Examine options and successful models of existing collaborations ranging from centralized to decentralized approaches, and make recommendations for a structure that could further the goal of collaboration between the private and public sectors for the objective of enhancing community resilience.

The study will be organized around a public workshop that explores issues including the following through invited presentations and facilitated discussions among invited participants:

- Current efforts at the regional, state and community levels to develop private-public partnerships for the purpose of developing and enhancing community preparedness and resilience;
- Motivators, inhibitors, advantages and liabilities for private sector engagement in private-public sector cooperation in planning, resource allocation and preparedness for natural and man-made hazards;
- Distinctions in perceptions or motivations between large national-level corporations and the small business community that might influence the formation of private-public sector partnerships, particularly in smaller or rural communities;
- Gaps in current knowledge and practice in private-public sector partnerships that inhibit the ability to develop collaboration across sectors;
- Research areas that could bridge these gaps; and
- Design, development and implementation of collaborative endeavors for the purpose of strengthening the resilience of communities to natural and man-made hazards.

BOX 1-2
Workshop on Private-Public Sector Collaboration to Enhance Community Disaster Resilience
September 9-10, 2009
AGENDA

Wednesday, September 9, 2009

8:30 a.m. Welcome and Introductory Remarks
William Hooke, Chair, Committee on Private-Public Sector Collaboration to Enhance Community Disaster Resilience, American Meteorological Society

PLENARY SESSION
PANEL 1: WHY A COLLABORATIVE APPROACH TO COMMUNITY DISASTER RESILIENCE MUST BECOME A NATIONAL PRIORITY

8:45 **Reactions and Reflections**
Moderator: *Randolph Rowel*, Morgan State University

Jason McNamara, Chief of Staff, Federal Emergency Management Agency
Mary Wong, President, Office Depot Foundation
Jim Mullen, Director, Washington State Emergency Management Division

9:30 Discussion

PANEL 2: BUILDING COMMUNITY DISASTER RESILIENCE THROUGH PRIVATE-PUBLIC COLLABORATION:WHAT DOES IT TAKE TO CREATE AND SUSTAIN EFFECTIVE CROSS-SECTOR PARTNERSHIPS AT THE STATE AND LOCAL LEVELS?

10:30 **Best Practices for Establishing Sustainable Partnerships**
Moderator: *Inés Pearce*, Pearce Global Partners, Inc.

Brit Weber, Program Director, Critical Incident Protocol-Community Facilitation, Michigan State University
Jami Haberl, Executive Director, Safeguard Iowa Partnership
Maria Vorel, National Cadre Manager, Mitigation Disaster Workforce and Head, Regional and Disaster Support Branch, Mitigation Directorate, Federal Emergency Management Agency

11:15 Discussion

12:00 p.m. Presentation:
The Critical Importance of Community and Cross-Sector Partnerships
Arif Alikhan, Assistant Secretary for Policy Development, Office of Policy Development, Department of Homeland Security

PANEL 3: MAKING THE BUSINESS CASE: MOBILIZING BUSINESS TO HELP ENSURE COMMUNITY AND NATIONAL DISASTER RESILIENCE

1:00 **Sustaining Business Involvement in Business-Government Collaboration**
Moderator: *Lynne Kidder,* Business Executives for National Security

Mickie Valente, President, Valente Strategic Advisers, LLC
Stephen Jordan, Executive Director, Business Civic Leadership Center, U.S. Chamber of Commerce
Gene Matthews, Senior Fellow, North Carolina Institute for Public Health, University of North Carolina

1:45 Discussion

BOX 1-2 (continued)

CONCURRENT SESSIONS

2:45 **Factors that facilitate or provide barriers to effective private-public partnerships**
Workshop participants to break into four groups (details provided in appropriate section of the briefing materials). Each group will discuss both topics.

Topic 1 Facilitating Factors
Topic 2 Barriers

PLENARY SESSION

4:30 Summary and Discussion of Concurrent Sessions

5:30 Adjourn

Thursday, September 10, 2009

PLENARY SESSION
PANEL 4: ROLES AND PERSPECTIVES OF STATE AND LOCAL GOVERNMENT IN BUILDING COMMUNITY RESILIENCE

8:30 a.m. **Fitting in a National Framework**
Moderator: *Michael Lesnick,* Meridian Institute

Governor Scott McCallum (Wisconsin, 2001-2003), President and CEO, The Aidmatrix Foundation, Inc.
Ron Carlee, County Manager, Arlington County, Virginia
Leslie Luke, Group Program Manager, County of San Diego, Office of Emergency Services

9:15 Discussion

10:15 **The DHS Voluntary Private Sector Preparedness Accreditation and Certification Program**
Emily Walker, Consultant and Member, National Commission on Terrorist Attacks Upon the United States

11:00 Discussion

12:30 p.m. **Building Sustainable Partnerships**

Topic 3 Sustainability
Topic 4 Resilience-Building Efforts and Widespread Implementation

3:15 **Overarching Workshop Themes: Presentation**
Brent Woodworth, President and CEO, Los Angeles Emergency Preparedness Foundation

3:40 Discussion: Game Changing Ideas and the Path Forward

4:20 Closing Remarks
William Hooke, Chair

4:30 Adjourn

WORKSHOP PLANNING

The Study and Workshop Planning Committee

The study committee, who also served as the workshop planning committee, consists of 10 members with expertise in the areas of natural disasters and science policy, private-public partnerships, social science and disaster preparedness, community resilience, crisis and risk management for disasters, disaster risk reduction policy, private sector disaster response and resilience, disaster planning and geographical information systems, vulnerability and resilience of underserved populations, and emergency management. Appendix A provides biographies of the planning committee members. The committee met once prior to the workshop and held several teleconferences to discuss the statement of task, identify presumptive principles, identify workshop participants, and develop a workshop agenda.

Workshop Presumptive Principles

The committee began preparations for the workshop by developing the presumptive principles that would guide their selection of workshop topics, speakers, and participants. Chief of those principles are that

- Community disaster resilience is essential to sustainable economic vitality and community quality of life;
- Collaboration is essential to build community disaster resilience; and
- Private-public collaboration implies engagement between governmental entities; diverse industry sectors; nongovernmental organizations including faith-based, voluntary, and citizen organizations; and other elements of the community that comprise the full fabric of the community.

Implicit in the discussion of building resilience in a community is that all sectors of the community can and should participate in all phases of a disaster—from preparedness and mitigation to long-term recovery. To further inform and clarify the assumptions in planning the workshop, the committee drew upon Etienne Wenger's definition of community as a group of people with common relevant interests (Wenger, 1999). Further, the committee accepted that a person's sense of community includes a "sense of place."

Given these presumptions, the committee sought to engage with workshop participants to understand more about the roles and needs of community actors with respect to resilience building and disaster preparedness planning and recovery. They wanted to understand how a community benefits from broad, resilience-focused collaboration as well as the requirements to support this type of collaboration:

- As a national priority at the local, state, and federal levels;
- By large and small organizations within the private sector;
- By nonprofit, voluntary, and faith-based organizations; and
- By individuals and families.

Information gathered at this workshop was intended to inform the committee's recommendations that will appear in its final report.

What Is Resilience?

The term "resilience" is encountered in many disciplines. Each discipline may emphasize different elements of resilience, but all definitions speak in a general way to the continued ability of a person, group, or system to function during and after stress. The committee did not want to limit discussion by imposing an arbitrary definition for resilience, but provided a definition it found helpful in scoping their own committee work and which they believed would be relevant for orienting workshop discussions.

The committee used a definition of resilience put forward by Norris and others (2008) that is becoming a standard in many academic circles. Norris and others describe resilience as the ability of groups (such as communities or cities) to withstand shock such as disaster. Because communities constantly change, the ability to withstand disaster constantly changes. Building and maintaining resilience depends on the ability of a group to monitor changes and appropriately modify its plans to deal with adversity. A well-functioning community composed of healthy members with a high quality of life is more likely to possess the ability to adapt to adversity. Building community disaster resilience involves fostering the characteristics and abilities within a community that allow it to continue to function during and following a disaster.

What Is Collaboration?

The term "collaboration" may also be defined in different ways. Definitions encountered by the committee included mention of mutually beneficial arrangements of roles and relationships in which all parties share responsibilities and coordinate resources toward the pursuit of common objectives (for example, Regan, 2009). The intensity of engagement of individuals and organizations within collaboration can vary from simple networking to one of contractual obligation. Identifying the elements of effective collaborative efforts was a purpose of the workshop and the larger study effort.

The term "collaboration" is used somewhat interchangeably with the term "partnership" in literature and discussion. The committee made a conscious decision to use the term "collaboration" in its discussions because "partnership" often connotes, in some disciplines, legally binding agreements between parties.

Structure of the Workshop

The workshop planning committee organized the workshop in order to gather information on the qualities of successful and enduring collaboration, and to identify elements of the cultural environment necessary for such collaborations to form and thrive. The workshop agenda was specifically planned to avoid the emotion that often accompanies discussion of failures af previous disaster response in order to focus objective discussion on issues of collaboration. The committee organized the workshop to encourage discussion on three major themes:

1. Identifying the facilitating factors and barriers to the formation of private-public collaboration for the purpose of enhancing community resilience;

2. Identifying the characteristics of effective, robust, and sustainable private-public collaboration; and

3. Encouraging widespread development of private-public collaboration for the purpose of enhancing community resilience.

The committee invited researchers; representatives from private and nonprofit organizations; emergency management practitioners and leaders from local, state, and federal governments; community organizers; and private-public sector partnership sponsors, facilitators, and members. Researchers and community leaders from different regions of the country with varying disaster experiences were invited so that a broad range of issues and perspectives could be considered. Approximately 60 people participated in the workshop. Participants are listed in Appendix B of this report.

The workshop included four panel discussions and two keynote presentations. Additional discussions were held in both larger plenary and smaller breakout sessions. A concluding plenary session focused on identifying overarching issues. Participants identified areas of research that could provide the information needed to build a culture of resilience and identify the path toward more extensive collaboration throughout the nation.

WORKSHOP REPORT ORGANIZATION

This workshop report is the first of two reports to be disseminated by the committee. This report is the committee's summary of what transpired at the workshop, but does not contain any consensus conclusions or recommendations. Committee recommendations will appear in the committee's final report. Further, this workshop report reflects only those topics emphasized during workshop presentations and discussions and is not intended as a comprehensive summary of all relevant topics and issues related to community resilience and collaboration. The committee will have assembled information in addition to what is presented in this report to inform its conclusions and recommendations. Although the committee is responsible for the overall quality and accuracy of this report as a record of what transpired at the workshop, the documented

observations or views contained in the workshop report are those of individual participants or groups of participants and do not necessarily represent the consensus of the workshop participants or committee, or of the sponsor.

This workshop summary is organized into four chapters. This chapter introduces the reader to the purpose and organization of the workshop and report. Chapter 2 explores the components of successful collaboration from the points of view of the private and public sectors and from different levels of government. Chapter 3 explores challenges and barriers to successful and sustainable collaboration. Chapter 4 describes potential research themes and mechanisms identified by workshop participants that could inform or enhance the ability of communities to develop private-public sector collaborations for enhancing community resilience.

2

Community and Disaster Resilience: The Collaborative Approach

This chapter summarizes how disaster resilience can be considered part of ongoing community resilience, and how collaboration among community stakeholders is an effective means of building that resilience. Key characteristics of successful collaborations identified by the diverse set of workshop participants who regularly engage in or study collaborative community resilience activities are also summarized.

DISASTER RESILIENCE AS PART OF COMMUNITY RESILIENCE

Jim Mullen, director of the Emergency Management Division of the Washington State Military Department, provided a simple definition of a resilient community: it is one that bends but does not break. Workshop participants discussed how community resilience is not just about disaster recovery. It may also include a focus on broader community planning, including land use, transportation, economic and workforce development, and emergency management planning, involving all community stakeholders. Some workshop participants stated that incorporating disaster resilience in community planning is essential to sustainable community resilience.

Building resilience can be difficult because it is not generally embedded in community culture. Ron Carlee, county manager of Arlington, Virginia, described how functional and resilient communities have to be built that promote a high quality of life every day, not just during disasters. The communities most likely to survive disaster are those actively committed to social equity and inclusion, that are economically and environmentally sustainable, and that create a vision to which its residents and institutions—public, nongovernmental, and private—can relate. Members of such communities have a sense of place, and its people are united in values and purpose.

Essential Resilience

Shirley Laska of the University of New Orleans described Ron Carlee's approach as one of building essential resilience—a condition toward which a community continuously works, regardless of whether a disaster is likely to occur. She indicated that essential resilience requires extensive collaboration, trust, respect, and partnering among different groups within a community to create cross-group, cross-racial and -ethnic, and cross-social class dynamics. These factors allow a community to define and develop the qualities that make it resilient.

A number of workshop participants observed that building essential community resilience accrues benefits everyday, not just during a disaster. Sociological and financial returns on investments are likely, although several workshop participants acknowledged that many of these benefits cannot currently be measured or documented. For communities to become essentially resilient, some participants stated that it is important for governments to foster a culture of resilience in which the private and public sectors think about resilience on a daily basis and recognize that it is good economic policy to grow resilient communities. For example, a business owner who develops a business continuity plan in the event of a disaster may better understand how his business fits into the fabric of the community, potentially giving the business a competitive edge. A community composed of resilient local businesses is more likely to display stronger business integrity, and its economy is likely to remain intact during and following a disaster. Similarly, resilient nongovernmental and faith-based organizations are more likely to be able to continue providing services to their constituents following a disaster.

Resilience Driven at the Community Level

Many workshop participants concurred that successful building of community resilience happens at the community level, driven by those most familiar and involved with the community and its needs. Several researchers and others at the workshop noted that networks and partnerships are often more successful when established at the local level with a bottom-up, locally relevant approach. However, a number of workshop participants also stated that building a nation of resilient communities is largely dependent on the facilitating—not prescriptive—support of federal and state governments. Ellis Stanley of Dewberry and Davis described the importance of community inclusiveness and community pride at the collaboration table. He indicated that the attitude of "it's not about us without us" needs to be adopted when planning for community disaster resilience.

Mitigation as Part of Resilience

Several workshop participants noted that mitigation is a part of resilience planning. A 2005 report by the Multihazard Mitigation Council[1] described a $4 benefit for every dollar spent in predisaster mitigation (MMC, 2005). Mitigation was described by Maria

[1] See www.nibs.org/index.php/mmc/ (accessed December 17, 2009).

Vorel of the Federal Emergency Management Agency (FEMA) as the sustained action taken to reduce or eliminate long-term risk posed by hazards to people and property. She, along with other workshop participants, described mitigation as needing to be justified in terms other than the return on investment in the protection against natural hazards. Communities are more likely to undertake mitigation and resilience-building efforts if the benefits are translated into terms that reflect general economic development and gain.

COLLABORATIONS FOR RESILIENCE

Why Collaborate?

When asked during the workshop about the most significant benefit of applying the collaborative approach to building resilience, Jason McNamara, Chief of Staff at FEMA, stated "if we don't do it, we fail." Paraphrasing the founder of Business Executives for National Security, Lynne Kidder of that organization suggested that failure is bad for business. Workshop participants observed that, since Hurricane Katrina, there is growing recognition in the corporate sector and within communities in general that private-public collaboration is an imperative. From the corporate perspective, private-public sector partnerships are a logical extension of their business continuity planning. It is in the best interest of the private sector to invest in the continuity of their communities to protect their customers and employees. Ensuring that critical services and public safety and health are provided for makes it more likely that businesses can stay open. This, in turn, ensures that citizens return to or remain in the community, providing customers for the businesses.

Arif Alikhan, assistant secretary for policy development at the Department of Homeland Security (DHS), stated in his presentation to the workshop that partnerships that include both the private and public sectors in planning and decision making allow for creative problem solving that may not occur when the public sector acts alone. As an example, Mr. Alikhan described an experience in Los Angeles during recent regional fires during which the region experienced power outages that affected communication among emergency responders. Starbucks Corporation and AT&T Inc. worked to open and expand the wireless local area network capabilities at Starbucks restaurants in the region, allowing community and emergency responders to access their networks. The aftermath of Hurricane Katrina exemplifies the impacts of ineffective collaboration.
Although monetary resources were abundantly available thanks to donations made immediately following the storm, people and organizations were ill-informed, disorganized, and unable to access donated resources because of a lack of collaboration and coordination. This persisted even 9 months after the storm; New Orleans looked much the same as it did when the disaster first struck. Effective collaboration could have led to the avoidance or more rapid solution to many of the problems experienced.

To increase community resilience, many workshop participants stated that mechanisms such as collaborations that maintain public commitment to disaster mitigation need to be developed. Mickie Valente of the Florida Council of 100[2] described

[2] See www.fc100.org/ (accessed December 1, 2009).

a need to plan for the continuum of emergency management activities, starting with mitigation, and including all phases of disaster management. According to Ms. Valente, planning for business recovery is important for minimizing economic impacts of disasters. Emergency support functions could better serve the community if they included identifying the needs of local businesses and helping them to obtain training related to resilience and planning prior to an emergency. Following an emergency, support functions could include efforts to get people back to work as quickly as possible in order to support the financial recovery of the community. Ms. Valente stated that planning of this type is best done at the state and local levels.

Trust: The Foundation of Collaboration

Workshop participants included individuals with experience forming or facilitating community collaborations. They shared elements they considered essential for the building of successful partnerships. Such elements include motivation, trust, some form of leadership, and a common mission that drives the purpose and structure of the collaboration. Mechanisms by which collaborations are developed, and the means by which they are sustained may vary.

Many workshop participants pointed out that collaborations that include all community stakeholders—all industry sectors, nonprofit organizations, and civic leadership—were more likely to be successful at building resilience. It was repeatedly emphasized that trusted relationships are the capital that drive resilience. Organization leaders are more likely to call those with whom they have had interactions and trust, especially during times of crisis. Private-public sector collaborations create networks of trust, and provide vital points of contact across sectors. Organization leaders are far less likely to trust information coming from unknown sources with unknown motivations.

Honest communication should also occur at all levels of government, according to Arif Alikhan. To influence behaviors in positive ways, it is essential that all levels of government effectively reach the wide range of populations necessary to promote understanding within networks among community partners. Like any other member of a partnership or collaboration, the public sector is obligated to understand the needs of its partners and have realistic expectations of what its partners can and cannot do.

Collaboration Theory

Jim Mullen likened collaboration to a chorus: it is the effort of all members collectively that yields a desired outcome. No single voice stands out. However, there is no one-size-fits-all or checklist approach that can be used to create and direct that chorus. Numerous collaboration models exist that can be embraced by different communities under different circumstances.

No single science of collaboration exists from which to draw. Collaboration theory has been studied and applied in a variety of disciplines. According to Gavin Smith of the University of North Carolina, Chapel Hill, there is extensive social science, social psychology, and sociological literature that discuss collaboration. Randolph Rowel of

Morgan State University indicated that the public health literature also includes extensive discussion of collaboration. Some workshop participants noted that negotiation and collaboration are taught in business and Foreign Service schools, and literature on collaboration has been operationalized in alternative dispute resolution as well as in techniques utilized by land-use planners, negotiators, and some in the international arena.

Collaborative theory has been applied in a number of arenas. Decision triage methodology provides mechanisms for dissimilar groups and critical decisions makers to make improved decisions under different levels of stress with less information. The methodology has a collaborative factor that allows for improved decision making. In the public health community, there is community-based participatory research and participatory action research in which a whole litany of terms exists to describe the effectiveness of organizations working together. Since 1990, the Center for Substance Abuse and Prevention[3] has funded 251 community partnership grants based on such research findings (Yin et al., 1997).

A challenge in moving from collaboration theories to practice is in translating these theories into language understood by all parties. Language found in the research literature does not translate well to assist practitioners in making good choices. In attempting to collaborate, multiple dissimilar organizations may have to agree which of the theories to apply under given circumstances, without necessarily understanding which theories may be appropriate.

Creating Partnerships

To learn about best practices for establishing sustainable partnerships, the committee invited to the workshop those engaged in helping others establish local- or regional-level partnerships. These individuals were asked to share how successful collaborative efforts are initiated at the state and local levels, and what factors make it possible to sustain the collaborations over time. Brit Weber of Michigan State University was invited by the workshop planning committee to give an introductory presentation, which is summarized in Box 2-1. He described steps that his program uses to facilitate the building of partnerships. Other workshop participants involved in the development of partnerships described many similar characteristics in their own processes.

[3] See www.prevention.samhsa.gov/ (accessed December 1, 2009).

BOX 2-1
Steps to Create Private-Public Partnerships
Brit Weber, Michigan State University

Since 1998, Michigan State University has received federal funding to research the efficiency and effectiveness of joint private- and public- sector activities related to crisis management that result in focus groups, research, best practices, and lessons learned. In 2000, the group published a document called "Critical Incident Protocol: Public and Private Partnership."[a] Michigan State University facilitated 47 partnerships at the city, council and regional level in 24 states at no cost. In doing so, the group learned how to create and sustain partnerships through the following steps:

1. **Identify public and private sector stakeholders to share leadership.** The private sector must be involved in leadership. Private-public partnerships can be successful with a public lead, but members of the community tend to respond better to their own kind (e.g., a police chief or mayor will respond better to public sector leadership whereas the owner of a hardware store may respond better to leadership by the private sector).

2. **Identify individual networks to be included in the partnership; ask leaders to bring them in.** Members of the partnership should creatively identify and engage anyone with a stake in preparedness and include them in the collaboration network.

3. **Identify common issues among partners related to emergency preparedness.** Private- and public-sector members will discover they share many of the same issues. Successful partnerships depend on the collaborative tackling of common issues.

4. **Identify new resources within the community to mitigate the impact of critical incidents.** The diversity represented within the partnership may reveal resources not otherwise available. Participants who recognize the availability of resources will feel integrated into problem-solving processes and approaches.

5. **Identify challenges encountered by participating organizations,** such as the challenges, risks, and threats caused from human-caused or natural disasters that threaten community organizations individually or collectively.

6. **Create sustainability in the partnership.** Partnerships should
   a. Determine the collective needs
   b. Define goals that provide direction
   c. Assign performance tasks, and
   d. Work collaboratively.

The problems and needs of local business and community leaders and members must be extrapolated, according to Dr. Weber, in order to identify who should partner with whom and determine how needs may be satisfied. Once established, the sustainability of a partnership can be measured by looking at six aspects: contract, contact, trust, understanding, empathy, and cooperation.

[a] See www.cip.msu.edu/ (accessed December 18, 2009).

Sustainable Collaboration

The sustainability of collaboration is more than a measure of financial sustainability; programmatic sustainability and the sustainability of relationships are key components. The foundation of a sustainable partnership is the network of relationships formed within it, and not necessarily a program that has been put in place by it. Several workshop participants pointed to the long-lived networks and collaborations that remain active in some Project Impact communities (see Box 2-2) long after funding for the Project Impact program ended. The networks continue to exist because the concepts of resilience and sustainability have been embraced and institutionalized within them. Institutionalizing the goals of a collaboration will help ensure that bonds between organizations remain strong even if individual people or funding move on. If a collaboration is built on the efforts of a single individual or start-up funding source, then it is essential to ingrain the mission and goals into the collaboration infrastructure to survive changes in leadership or funding.

Maria Vorel of FEMA described successful Project Impact communities as those that included local leadership and community advocate involvement. The partnerships had well-developed visions, goals, and strategies. They adopted public education strategies, plans, and implementation to get greater community acceptance. Broad-based structures were in place that enhanced participation of all sectors. The successful communities adopted risk reduction plans and mitigation projects that reduced risk to their communities, and developed flexible roles among collaborators based on skills and abilities to commit resources and time. Community and cultural assets and resources were identified, as well as the external influences on a community (e.g., watershed planning or economic development districts). Some successful Project Impact communities developed mechanisms to facilitate the collaboration, such as those now provided in Iowa by the Safeguard Iowa Partnership (see Box 2-3).

BOX 2-2
Project Impact

In 1997, Congress first appropriated funds for the direct purpose of funding mitigation activities for disasters (McCarthy and Keegan, 2009). With this appropriation, the Federal Emergency Management Agency (FEMA), created a pilot program called Project Impact: Building Disaster Resistant Communities. At its inception, FEMA Director James Lee Witt described the program as "designed to break the damage-repair, damage-repair cycle and instead help communities become disaster resistant (Witt and Morgan, 2002, p. 42). Project Impact placed emphasis and resources on community-based and led efforts to mitigate against hazards. Communities were required to have the commitment of local governments, nongovernmental organizations (NGO), and local businesses. An educational component of awareness was also required. Funding was provided by FEMA to form public and private partnerships within the individual communities. Project Impact envisioned four steps to building a disaster-resistant community:

1. Building partnerships by organizing a disaster-resistant community planning committee including business and industry, public works and utilities, volunteer and community groups, government, and education, health care, and workforce representatives;

2. Assessing a community's risks and vulnerabilities;

3. Identifying mitigation priorities, measures, and resources and taking action; and

4. Communicating progress and maintaining collaborative involvement and support for long-term initiatives.

One Project Impact example of success is Tulsa, Oklahoma. Through community effort, Tulsa instituted long-term mitigation activities to reduce flood frequency and severity. Their efforts included improving channels and detention storage basins and maintaining and clearing more than a 1,000 buildings from floodplains.[a] Despite the termination of Project Impact in 2002, private-public sector collaboration to improve community resilience continues today through an NGO called Tulsa Partners, Inc.[b]

Project Impact was initiated in 1997 with a $2 million appropriation. The program received $30 million in 1998 and $25 million during 1999-2002. In February 2001, Congress approved the Bush administration's proposal to eliminate Project Impact, less than 5 years after its inception. The administration sought to create a program to carry out mitigation efforts directly.

[a] See www.emergencymgmt.com/disaster/Project-Impact-Initiative-to.html (accessed December 1, 2009).
[b] See www.tulsapartners.org/About (accessed December 1, 2009).

BOX 2-3
The Safeguard Iowa Partnership

The Safeguard Iowa Partnership[a] was described by Jami Haberl, director of the partnership. The private-public partnership was launched in 2007 with the assistance of the Business Executives for National Security,[b] the Iowa Business Council,[c] and three Iowa state agencies, and is a voluntary coalition of Iowa's business and government leaders. The partnership leads a statewide effort to integrate the resources and expertise of the state's business leaders with those in government to improve all phases of disaster management. The overall vision of the partnership is to ensure safe, resilient residential and business communities in Iowa. Success of the partnership has been dependent on co-leadership by large businesses in the state and state directors, as well as on funding; the partnership has grown more than sixfold in its first 24 months. A portion of program funding supports a small full-time staff to facilitate partnership activities. Safeguard Iowa Partnership Staff is a neutral party that represents the interests of all partners and assists in improving communication between all partnership collaborators. Efforts are continually made to represent the needs of all the diverse communities in the state. Partners are empowered by being involved in identifying challenges and strategic planning.

[a] See www.safeguardiowa.org (accessed December 1, 2009).
[b] See www.bens.org/home.html (accessed December 1, 2009).
[c] See www.iowabusinesscouncil.org (accessed December 1, 2009).

Once Project Impact partnerships were established, multihazard identification and risk processes could be enabled. Ms. Vorel stated that partnerships today could be formed in a similar manner by setting aggressive goals to include as many community stakeholders as possible at initial stages of planning and information exchange. It is in these stages that the mission be clearly defined and metrics for success established and agreed upon by all parties. According to many at the workshop, it is essential that all parties also engage in implementation of plans and establish mechanisms for regular evaluation of goals, strategies, and implementation activities. Some workshop participants stated that successful mitigation efforts could be documented, and just as important, celebrated as examples for others to follow.

Effective and sustainable partnerships are those that are flexible enough to allow for long-term thinking when choosing a path toward resilience. Without flexibility, natural community evolution could not be accommodated. As Sandra Cowie of the Principal Financial Group stated, partnerships have to plan for succession and continuity of operations just as organizations in the public sector are expected to do.

Characteristics of Leadership

Sustainable networks are dependent in part on strong leadership with a clear vision. Arlington County, Virginia, was described by Brit Weber as having strong leadership, and because the vision of the leadership has been embraced throughout partnerships in all sectors, the collaborations are likely to be sustained even after there has been succession in leadership. Models for network leadership vary from community to community

depending on the dynamics and needs of a given community. Many workshop participants have described how collaboration is most effective if leadership is shared between the private and public sectors. Participants did hear examples of ongoing collaborative efforts with different operating models. The Earthquake Country Alliance,[4] for example, is an example of collaboration led largely by the efforts of the scientific community, but embraced by the public sector. It is a statewide collaboration of networks linking pubic information efforts of organizations and individuals that provide information about earthquakes and services.

In San Diego County, California, collaborations are managed by the public sector, according to Leslie Luke of the San Diego County Office of Emergency Services. Their goal is to look at short- and long-term recovery through mitigation and a risk management strategy. Collaboration in San Diego is often accomplished by means of small and separate partnerships so that individuals can discuss issues of common concern in focused groups. Each group has a target objective. Public sector oversight avoids issues associated with overlapping objectives between groups. Effort is made to avoid having a single issue overwhelm the proceedings of an entire meeting. San Diego County plans to hold future business summits to establish business-driven advisory groups. These groups will receive only support from the government and will inform government of their resources and needs. Part of the government's role will be to provide educational assistance to private-sector employees, helping them to prepare at home. This will increase the likelihood of their more expedient return to work, getting businesses up and running more quickly during the next crisis.

Scalability

Scalability is the ability of an organization or technology to accept changes in volume without impacting effectiveness. Partnerships established on networks of relationships are created on an inherently scalable system as compared with hierarchical organizations that require problems to be solved following established procedures along a single chain of command. John Harrald of the Virginia Polytechnic Institute and State University gave an example of scalability by describing hospital networks that existed at the time of the 2001 anthrax episode on the Capitol in Washington, D.C.[5] Individual hospital preparedness networks took it upon themselves to create a phone network to coordinate response of 60 hospitals, health clinics, and other facilities in the D.C. area. The goal was to locate resources, coordinate, and share information. Private and public health facilities, government officials, and volunteer organizations became involved. The resulting network was much larger than the original network and was scalable because the system could plug into existing networks. Unfortunately, the network was not sustained or incorporated as part of the regional emergency management system after the 2001 incident.

When considering resilience-building activities, the definition for scalability should also include the ability to translate a process from one population to another, according to

[4] See www.earthquakecountry.info/ (accessed December 1, 2009).
[5] See www.fbi.gov/anthrax/amerithrax_factsheet.htm (accessed December 1, 2009)

Lakshmi Fjord, research director for Collaborating Agencies Responding to Disasters.[6] This is especially problematic for rural communities for which the problem is often one of scaling down rather than up, according to Mr. Plodinec. Brit Weber suggested that processes become scalable by describing different ways in which private-public sector collaborations can be formed.

From the business perspective, companies are scalable and grow in three ways: increases in sales (organic growth), mergers and acquisitions, or through a hybrid structure that is a type of joint venture. Companies that partner do more business. According to Peter Hitt of the U.S. Trust/Bank of America, business growth models might offer insights into scalability of partnerships and the capital requirement components of different types of scalability.

DIFFERENT PERSPECTIVES

Emily Walker, a private banking consultant based in London, England, and former staff member of the National Commission on Terrorist Attacks upon the United States (also known as the 9-11 Commission)[7] described how the need for private-public sector partnerships is not unique to the United States, nor is the mechanism unique for solving problems related to disaster at the local level. For example, following the 2004 Indian Ocean tsunami that killed over 200,000 people, the United Nations World Food Programme[8] had to depend on real-time coordination with the private sector to locate working space in the stricken area. In 2006, the World Food Programme formed a private-public partnership to develop a global emergency network allowing corporations to donate goods and services ahead of global disasters.

The next sections of the report summarize some of the main themes discussed among participants, but from different perspectives.

The Private-Sector Perspective

Business involvement in private-public sector partnerships is motivated by three themes, according to Gene Matthews of the University of North Carolina at Chapel Hill:

1. **"Protecting the brand."** Individual organizations do not want to be remembered as the company, medical center, bank, or NGO not involved in doing the right thing for the community. To stay competitive, an organization has to keep up with its competitors. Participation by the competition motivates business involvement in community resilience building and disaster mitigation and response activities.

2. **"Enlightened altruism."** Doing what is in the best interest of the community is often in the best interest of an organization. There is self-interest in maintaining

[6] See www.CARDcanhelp.org (accessed December 17, 2009).
[7] See www.9-11commission.gov (accessed December 1, 2009).
[8] See www.wfp.org (accessed December 1, 2009).

a healthy local economy. For example, tourism and the general economy of Toronto, Canada, were severely impacted when the World Health Organization[9] issued travel advisories against nonessential travel to the region during a 2003 outbreak of severe acute respiratory syndrome (SARS). To renew the economy, the travel industry offered discounts for travel, hotel, and local attractions. Regional airlines included Web links to competitors' Internet sites to promote travel to Canada. Promoting tourism more generally, even if promoting one's competitors, was recognized as beneficial for all regional businesses.

3. **"Don't bet the company."** Good Samaritan laws exist that protect individuals against liability for injuries accidentally inflicted while acting in good faith during emergency situations. Businesses in many states do not receive similar protections. All organizations leave themselves exposed to liability when providing assistance to the community, and liability concerns affect the ability or willingness of businesses to participate in resilience building or disaster response activities. Companies with offices in multiple states may find it difficult to understand liability-related legislation in different states. Small businesses may not have the resources or capacity to understand liability issues at all.

Many in the private sector are starting to see the benefits of active participation in resilience-building collaborations. However, workshop participants did not agree the form of engagement.

Sandra Cowie, Director of Corporate Security and Business Continuity of the Principal Financial Group summarized key factors for successful private-public sector collaboration within communities that could be facilitated at the state level. The factors include

- **Shared defined strategic focus** such as short- and long-term vision, mission, objectives, deliverables, and performance measures. Strategic planning should occur initially, and then periodically, with both public- and private-sector leadership to ensure that strategies are contemporary and address appropriate issues. One- to three-year project plans could be developed during periodic reviews.

- **Ownership and accountability** for execution of strategies. After identifying strategies, teams of volunteers, facilitated by dedicated staff, can then focus on key objectives and deliverables. Local emergency managers are typically overtasked and unable to serve effectively as facilitators of partnerships. Therefore, dedicated staff at the state level, ideally a neutral party, could serve as a coordination point that represents the joint interests of both the private and public sectors.

[9] See www.who.int/en (accessed December 1, 2009).

- **Sustainable funding.** In general, more effective and flexible means of utilizing government funding are needed to cover very basic operational and personnel costs. There is a need to break out of the government grant paradox to ensure sustainability.

- **Building local and then regional support.** Obtain support for collaboration from local private- and public-sector leaders—for example, from directors of corporate security and business continuity in strong organizations; public health, public safety, and local emergency management officials—then build support at the state level, for example, within the governor's office. Broader support for collaborative efforts will be garnered when these bases of support are obtained.

- **Establishing communication methodologies.** Quickly establish a means to share accurate real-time information. Success depends on identifying who owns the responsibility for disseminating information. Communication may begin as the generation of simple email distribution lists.

- **Developing a marketing plan.** Educate others about the partnership and the expected returns on the investment in collaboration.

- **A clearly defined organizational structure.** Establishing a defined infrastructure will ensure that individual roles and responsibilities are understood by all. This creates efficiency in execution.

Peter Hitt advocated the creation of a business prospectus for developing private-public sector partnerships that effectively encourage participation among the business community. He shared a summary prospectus for national resiliency with workshop participants as an example (see Box 2-4). Corporate executives often do not have the time to read long descriptive documents and want concise communications on which to base their decisions. One-page descriptions written in language corporate executives relate to are an optimal means of communicating with this audience. The great diversity within the business sector, such as between commercial sales firms, service industries, media, utilities, and financial and insurance institutions, differ in purpose, character, and style, and may require different incentivizing approaches. Language in a prospectus may have to be adopted appropriately.

Many workshop participants voiced the need for greater public-sector support and engagement in collaborative activities. Some individuals described a perceived lack of public-sector funding for activities considered public-sector responsibility. The private-sector can be hesitant to participate in collaborative efforts if they feel they are carrying the financial burden. Public sector support is also sought in the form of legislation related to liability and insurance. Legislation created to clarify or limit liability for good-faith disaster preparedness and response efforts would be welcomed by the private sector, as would legislation encouraging incentives from insurance companies for contingency planning and resilience building.

BOX 2-4
Summary Prospectus for National Resiliency

Peter Hitt of U.S. Trust/Bank of America advocated the development of a one-page prospectus for expedient and effective communication with corporate executives. Such a document could efficiently communicate the benefits of collaborative efforts to build resilience into the corporate culture in specific, and to the community in general. Below are potential elements of a prospectus developed by Mr. Hitt, using language executives would understand:

Vision: A proactive "National Resiliency Culture"

Mission: To derive a scalable, self-sustaining national (private and public sectors) model

Economic System: An evolution of the insurance industry model

Concept of Operations: Spiral developing technical/social network and systems integration

Technical Concept: An open architecture, nonproprietary brokerage backbone

Organizational Structure: A "public benefit organization" to support regional coordination and business utility functions

Management Structure: Decentralized regional offices that parallel the FEMA Regions

Funding Model: Brokered private and public sector direct and in-kind funding options that can be supported by governmental incentives and/or regulations where economic and business models warrant

These factors may contribute to the lack of historical participation by chambers of commerce in private-public sector collaboration. Ms. Valente stated that chambers of commerce may also be unwilling to publicly address the vulnerability of their regions to disaster because they are generally trying to attract business to their locations. Rather than participation in private-public sector collaborations, Stephen Jordan of the U.S. Chamber of Commerce described how chambers are adopting practices to support each other, such as "Adopt a Chamber" or "Adopt a Business" programs that help local businesses function following a disaster when emergency funds run out but the local economy has not yet been reestablished. He suggested placing greater emphasis on better coordination among private sector entities so that efforts can be coordinated in complimentary ways. According to a model he presented, private-public sector collaboration accounts for only 10 percent of total intensity of network engagement. Coordination of activities accounts for approximately 20 percent of engagement. The remaining 70 percent of network participation is communication within the networks.

Regardless of the mode of engagement, Mr. Jordan stated that the private sector benefits from resilience building by reducing the impact of disasters on consumer purchasing power and minimizing the time for economic recovery. Improving the resilience and sustainability of a region, such as the Gulf Coast, may also have the added benefit of making the region more attractive to economic investors. Ms. Valente stressed that organizations that set up disaster contingency and business continuity plans are likely

to be more resilient in the event of a disaster, giving them an edge over their competitors (see Box 2-5 regarding business continuity planning).

Some businesses will go into decline during and following a disaster because the need for their services has waned. Small businesses[10] (e.g., locally owned and operated businesses with only a handful of employees) are more likely to survive a disaster if they are prepared to reinvent themselves. Collaborations that include the full fabric of the community may help such businesses determine what their roles can be in getting the local economy functioning again. This may help them get back in business sooner. Intact businesses of any size following a disaster are also in a better position to aid in recovery efforts through donations and volunteer activities.

[10] The term "small business" was used by workshop participants to refer to small, locally owned and operated businesses—sometimes referred to as "mom and pop" businesses. These were generally considered to have fewer resources than larger businesses. However, the U.S. Small Business Administration defines a small manufacturing or mining business as one with up to 500 employees. A small nonmanufacturing business can have up to $7 million in annual receipts (see www.sba.gov/contractingopportunities/officials/size/index.html, accessed January 15, 2010). It is this definition that allows a business to qualify for federal assistance programs.

BOX 2-5
Business Continuity Planning Certification

Emily Walker, private banking consultant and former member of the National Commission on Terrorist Attacks upon the United States (also known as the 9-11 Commission)[a] gave a keynote presentation on the 9-11 Commission's recommendation for national standards for emergency preparedness and the establishment of an accreditation and certification program for business disaster resilience. She shared a video excerpt of her own testimony given during the final public hearing of the 9-11 Commission in 2004. In it she stated:

> Homeland security and national preparedness should include: (1) a plan for evacuation; (2) adequate communication capabilities; and (3) a plan for continuity of operations. All three elements were tested in the private sector experience at the World Trade Center [on September 11, 2001].

Her testimony detailed observations related to evacuation and communication planning. Part of her testimony related to continuity planning was:

> the third pillar of private sector preparedness is continuity of operations. The response to 9/11 illustrates that continuity is one of the most difficult challenges because many of the people involved in continuity are also closely involved in the event. . . .
>
> At a hearing held at Drew University last November [2003] . . . witness after witness told the Commission that despite 9/11, the private sector remains largely unprepared for a terrorist attack. We were also advised that the lack of a widely embraced private-sector preparedness standard was a principal contributing factor to this lack of preparedness.
>
> The Commission responded by asking the American National Standards Institute (ANSI) for help. To develop a consensus, ANSI convened safety, security, and business continuity experts from a wide range of industries and associations, as well as from federal, state, and local government, to consider the need for standards for private sector emergency preparedness. ANSI has recommended to the Commission a voluntary national preparedness standard based on prior work of the National Fire Protection Association, with a common framework for emergency preparedness. . . .

The business sector has not come far in terms of continuity planning since 2004, according to Ms. Walker. The final report of the 9-11 Commission endorsed ANSI's recommendation for national standards and looked forward to incentives to encourage the private sector to voluntarily comply with the standards. As of the date of the NRC workshop, the Department of Homeland Security had assigned ANSI as the accreditation board, but criteria for accreditation had not yet been set. Ms. Walker believes there is a business case for having an accreditation process. She indicated that there is a perception of disaster preparedness among people and businesses, but the preparedness, in reality, does not exist. Her recommendation for business continuity managers was to be certain they impart the importance of risk assessment and preparedness to their superiors in their organizations. If the need for this kind of planning is not accepted and incorporated into corporate governance, the continuity planning will not be effective.

Concerns were raised by some workshop participants that contingency planning is an overwhelming process, and that work toward accreditation can be expensive and potentially prohibitive for small businesses. Others participants discussed how some in the private sector find further government regulation distasteful. Still others raised the question of how such federally regulated accreditation is consistent with the bottom-up community approach advocated by many throughout the workshop. Ms. Walker responded that the point of adopting national standards for continuity planning was to encourage preparation and regular review of continuity

plans. The federal standards are such that planning efforts are focused primarily on evacuation and communication after a disaster. The standards are sufficiently broad to accommodate the needs of all sectors and levels of government. Businesses can become accredited at their own pace.

Ms. Walker admitted that there is little advantage for small companies such as independent dry cleaners to go through the expense of becoming accredited. However, these companies can be encouraged to develop continuity plans independent of the formal accreditation process. In some cases, commercial developers who own the buildings in which small businesses are located are encouraging accreditation among their tenants. It is in the best interest of the building owners to make sure their tenants have plans in place that will allow them to stay in business. Building owners and managers in the United Kingdom take on the responsibility of helping their tenants develop continuity plans.

[a] See www.9-11commission.gov (accessed December 1, 2009).

The Public Sector Perspective

Individuals with experience in state and local government were invited to provide their perspectives on the roles of different levels of government in furthering community resilience and collaboration. They shared the needs of state and local governments that could be met using resources from their respective jurisdictions as well as those that could be met by the federal government and other key collaborators to enhance community resilience.

Local-Level Needs

In his presentation during one of the panel discussions, Ron Carlee, County Manager of Arlington, Virginia provided basic tenets of community resilience building:

1. **Communities need motivation to engage in community resilience planning.** Without a sense of urgency, resilience planning will not take place. It was the attack at the Pentagon (located in Arlington County) on 9/11 that gave urgency to the need for resilience planning in Arlington County. There is no need for every community to plan for every possible scenario. Communities should plan to respond well to disasters likely to occur. This gives the community a strong platform from which to respond to the improbable.

2. **Resiliency is not just for disasters.** A resilient community is also sustainable and healthy. Building a sustainable community is a complex enterprise requiring interplay among all community stakeholders. Leaders need to work together to define a clear vision, build trust, and create structures for engagement.

3. **Leadership is essential.** To encourage successful collaboration, it is essential a catalytic presence exist. However, a collaboration that is dependent on a single leader will not be sustainable.

4. **Building community is the primary business of local government.** Local government is more than the services it provides. The services should be part of a public policy strategy to create sustainable communities. Real outcome metrics are community indicators of economic, environmental, and social strength.

5. **Multiorganizational efforts require purpose and structure.** As stated earlier in this report, vision and mission are necessary. The vision and mission should inspire network participation.

6. **Trust is essential.** Establishing mutual trust among all participants is fundamental, especially in voluntary, nonhierarchal networks. The first step to building trust is simply getting to know one another. Challenges arise when there are changes in networks such as those that come in response to election cycles or the normal turnover of key personnel. Relationships based on trust must be continually developed and maintained.

Jim Mullen agrees that coalitions between the private and public sector are best organized at the local level. He suggests collaborations should be founded with groups such as community- and faith-based organizations, led by the emergency management community. These groups are vital to maintaining the social equilibrium of a jurisdiction. Regardless of the origins of a disaster, it is essential to establish goals at the local level that mitigate against damage likely to occur. Effective goals are those that are affordable and minimize disruption to the community caused by a disaster. A benefit of collaborations established in this way is the potential reduction in government expenditures during all phases of emergency management.

It is in the public interest that businesses stay open for business so that the market will continue to function. The more self-sustaining a community, the better government can focus on critical needs during a disaster. Communication enabled through collaboration helps create the necessary environment. Mr. Mullen stated that the government should place itself in a supporting role by providing accurate real-time information so that private industry may adapt their supply chains during an emergency. The private sector is often unable to move critical disaster supplies into an afflicted community because of lack of communication from the public sector.

Communicating that businesses gain a competitive advantage by opening doors faster than their competition, and they stand to gain new customers by having goods and services to offer when other businesses are closed, may encourage private-public sector collaboration. Businesses that can stabilize profit and keep workers employed and paying their bills following a disaster help stabilize a community's tax base and keep unemployment down. This, in turn, reduces payouts from the government for other types of social services.

In some cases, collaborations form as a result of need. Leslie Luke of the San Diego County Office of Emergency Services described San Diego County's introduction to private-public sector collaboration in response to the threat of wildfires in 2003. There were 15 fatalities as a result of the fires, 2,200 homes burned, and 22 businesses lost as a result. The communities facing the hazards were ethnically diverse, creating challenging

circumstances under which to communicate on a broad scale. The public sector reached out to the business community to encourage family disaster planning in a media campaign. After significant contributions from the private sector, community leaders decided to harness the expertise within the business community and held a summit that forged relationships that contributed to future community management during fire seasons. Special efforts were made to include those from multidenominational faith and migrant communities in the collaborations.

Needs from Higher Levels of Government

It has been stated several times that successful resilience is planned for and built at the local and community levels. The role of the federal government is not to be prescriptive, but to work as a partner with communities to reach solutions. Jason McNamara, chief of staff for FEMA, stated that FEMA is not the preeminent emergency management organization in the country. More responsibility for emergency management could be moved from the federal to the state and local levels. FEMA is moving toward giving its regional offices more responsibility for activities such as logistical management during emergencies. Regional administrators will be encouraged to focus on partnership and system building for emergency management with the states.

Dan Alesch of the University of Wisconsin, Green Bay (emeritus), encouraged that DHS and FEMA move beyond thinking of resilience as protection of physical infrastructure, but as protection of communities more systemically. He stated that communities need to be protected against what happens when disasters trigger cascading consequences beyond the initial incident. These are consequences that destroy the local economy and leave the community in social ruins. Other workshop participants stated that thinking of the protection of communities in a more systematic manner could be adopted at all levels of government. A community that is resilient to disaster, whether of natural, financial, or terrorist origin, is one that prepares for all phases of the disaster cycle (e.g., from mitigation through recovery), and considers recovery in the longest of terms. Mr. McNamara stated that he expects that FEMA will change its focus of activity away from response and recovery, and toward creating a culture of resilience.

3

Challenges and Barriers

The United States is, in general, a socially and economically resilient nation, according to some workshop participants, but numerous questions were raised regarding how to make individual communities more resilient during the course of the workshop. What has U.S. society done correctly in terms of recovery and maintaining social cohesion in the face of enormous disasters? Can the characteristics that make the nation resilient be translated to the local level to make communities resilient? Can collaborations and community resilience be built using the frameworks of existing collaborative entities, or are new mechanisms needed? Many workshop participants pointed out that the government and private sectors are not natural allies and that the United States has developed legal, cultural, and regulatory barriers that may discourage private-public sector collaboration. How, then, are these barriers to private-public sector collaboration overcome?

This chapter explores some of the barriers to building sustainable private-public sector collaborations and partnerships that have been identified by workshop participants. Potential research questions and themes are addressed in Chapter 4.

BARRIERS TO BUSINESS SECTOR ENGAGEMENT

During market equilibrium, there is a certain amount of needs and a certain capacity to fill those needs. Stephen Jordan of the U.S. Chamber of Commerce stated that a critical problem faced by a community as a whole following a disaster is the existence of both demand and supply shock to a local economy. A demand shock is created when everyone in a community needs everything at once. However, the capacity to fill those needs may not be available, creating a supply shock. Until community needs are met or cease to exist, equilibrium will not be reestablished. He summarized six key barriers to meeting those needs and to sustaining business involvement in community disaster resilience efforts more generally. These barriers are relevant for businesses of all sizes.

1. **Natural disasters do not respect political jurisdictions.** The nation's political jurisdictions are increasingly divorced from its economic, social, and

environmental spaces. Policy is often dictated by legacy issues dating back to the seventeenth and eighteenth centuries which have no real significance to society and the economy today.

2. **A perception of public sector inefficiencies in disaster response exists.** The private sector may believe that emergency response is conducted on an ad hoc basis without institutional memory of lessons learned from previous events. There is a need to systematically codify best practices and remove inefficiencies.

3. **A holistic approach to community resilience building is lacking.** There is a need to link educational, medical, workplace, and transportation systems in resilience building and disaster response activities.

4. **Resource coordination is lacking.** There is a need for better understanding and coordination of public and private resources during disasters. An example was given of a post-Hurricane Katrina event. The Federal Emergency Management Agency (FEMA) requisitioned oil and gas reserves intended for the Red Cross. In so doing, the Red Cross did not have the fuel needed to carry out its own response activities. Better coordination could have prevented this scenario.

5. **Disaster response systems are not maintained.** Recovery processes can take years. It is difficult for collaborators to maintain momentum for extended periods.

6. **Discrepancies between public and private sector approaches exist.** Public and private organizations often have very different perspectives and approaches to disaster management. Additionally chief executive officers (CEOs) may have diverging views regarding disaster response and recovery among themselves and may not appreciate public sector approaches. Public sector responses are often regulated by the Stafford Act.[1] The private sector tends to prefer tighter goals than the public sector, and prefers more discretion in the strategies and tactics used to achieve them than the public sector is allowed by law.

The issues raised about barriers to sustainable private-public sector partnerships discussed during the workshop often fit in some way into one or more of these six categories.

The next sections organize challenges identified by participants.

National and Local Business Engagement

Enlightened altruism is a powerful motivator for both small and large businesses to engage in community resilience-building collaboration. However, there are many challenges in effectively integrating the business community into resilience-building

[1] See www.fema.gov/about/stafact.shtm (accessed December 1, 2009).

processes. Locally owned and operated businesses may not have the resources, including time, to engage in community resilience-building efforts. Although they may have resources necessary to enhance disaster recovery, large businesses managed from outside a community may not be well integrated into the fabric of a local community and may not identify with, understand, or respond to the needs of the community. Large corporations sometimes have liability concerns that become more complex if their businesses operate in multiple states, nationally, or globally

Partnership activities by large companies often receive attention following successful recovery from disaster. Although this is important and may provide useful models, the "real job creation engines of this country…[lie] fallow if we can't bring [small business] into the conversation" according to M. John Plodinec of the Savannah River National Laboratory. Workshop participants noted that many local economies depend on the viability of their small businesses. However, many small businesses are unable to survive a disaster. It is essential to engage small business in the collaborative planning process. A challenge is in determining how best to initiate and sustain that engagement.

Building a more resilient community can be considered equivalent to decreasing community risk and uncertainty, according to some workshop participants. Resilience-building collaboration may not decrease the risk of disaster, but may substantially mitigate the impacts of disaster and lead to faster recovery. Some participants questioned whether resilience levels in a community could influence whether a business chooses to establish itself in one community versus another. Others postulated that determining a means of rating or objectively assessing a community's resilience could factor into influencing private sector investments and facility location decisions, potentially contributing to a community's economic growth or stability. Gene Matthews of the University of North Carolina at Chapel Hill said that measuring preparedness and resilience in various categories by state is already done to a limited extent, citing the Trust for America's Health[2] rating of states in select categories. Though some question the methodologies used, ratings in categories such as facility or organizational liability has encouraged some states to address issues associated with business liability protection. Establishing appropriate metrics that ultimately encourage business engagement is a substantial challenge.

Concern was raised by some workshop participants that the characteristics of and issues faced by small or large businesses may be generalized when recommendations for overcoming barriers to collaboration are ultimately made. This could limit the usefulness of recommendations.

[2] See www.healthyamericans.org/ (accessed December 2, 2009).

Business Engagement in Small and Rural Communities

Barriers to business sector collaboration are amplified in some rural communities, according to Adele Lyons of the Knight Foundation in Gulfport, Mississippi, because resources may be more limited, and individuals are isolated by their lack of physical proximity to their neighbors. A "go-it-alone" attitude may prevail in some rural areas, creating additional cultural barriers to collaboration to be overcome. Tools and mechanisms to assist in the development of collaborations often do not take into account the special needs of businesses in small or rural communities.

JURISDICTIONAL CHALLENGES

The Roles of Federal and Local Jurisdictions

Dealing with disaster-related issues that cross political boundaries is challenging. A need was expressed by some workshop participants to reconcile economic, social, environmental, and political roles and jurisdictions so that communities may pursue more effective resilient strategies and better respond to disasters. Many workshop participants noted that the role of governments at different levels is not as clear as would be most useful. New and important issues, such as the spread of the H1N1 virus,[3] can quickly overwhelm the reality of limited time and resources, especially at the local community level. This is further compounded by the time necessary to sort the respective roles of governments and organizations. Some workshop participants observed that the federal government may often be more flexible and more proactive in emergent situations than local governments and may provide some forms of assistance. Building trust and improving communication between different levels of government, as well as within different agencies at any given level of government, is essential for clear and sustainable disaster reliance collaboration.

Workshop participants noted that the responsibility and burden associated with disaster planning is often legislatively placed at lower levels of government by higher-level governing bodies. Scott McCallum, former governor of Wisconsin, currently with the Aidmatrix Foundation, Inc., described the need to think beyond federal mandates, and think in terms of identifying and proliferating best practices. He also stated that federal agencies such as the Department of Homeland Security (DHS) need to learn how to better coordinate with other federal agencies such as the Department of Health and Human Services, the Department of Education, and the Department of Commerce in order to determine how to appropriately support the needs of state and local governments.

When discussing FEMA's role in building resilience, Jason McNamara stated that FEMA's function should not be to enter a community at the time of a disaster and dictate how to operate. Instead, FEMA's first role should be to help identify problems and issues on a daily basis and to work as a partner toward locally relevant solutions. He stated that FEMA's second role is to help integrate resilience building into day-to-day emergency management operations. It is important to avoid the "domino theory" of emergency

[3] See www.cdc.gov/H1N1FLU/ (accessed December 1, 2009).

management—one in which the state government becomes involved only when local agencies fail, and the federal government becomes involved if failures occur at the state level. The model of responsibility could be more like concentric circles around an issue with local government at the center and the federal government supporting local and state responsibilities. The responsibilities of each level of governmental could be shared in alignment with their appropriate roles and hence their activities conducted in concert with one other. FEMA, according to Mr. McNamara, does not make up the team nor is it the keeper of the resilience-building plans, but FEMA could be considered part of the team that can help to perpetuate the message of the importance of resilience, collaboration, and planning. Maria Vorel of FEMA stated that a better role for the federal government could be to serve local government with technical assistance and support via affirmation rather than prescriptions and forced compliance.

When a disaster occurs, it is often challenging to coordinate the delivery of resources, goods, and services across jurisdictional boundaries. Different levels of government are not always aligned, and different agencies within any single level may not collaborate well. Several workshop participants observed that federal, state, and local governments may not share trust and respect for one another, and rivalries may exist, even at local levels of government, between different emergency management offices. These prevent efficient communication and response which only damage the community's ability to efficiently and effectively respond and recover from a disaster. Participants shared anecdotes in which the lack of a common communication infrastructure between police and firefighting organizations, for example, caused problems ranging from minor inefficiencies to major gaps in emergency response. Getting past these barriers for the sake of building community resilience is a challenge. Workshop participants stressed the importance of removing the "silos" that government, nonprofit, and private organizations into which they are too often placed. Many participants stated that the public sector has not yet recognized the potentially greater value of all organizations working together rather than each organization working separately. DHS could lead collaborative partnerships by example. The concept of resilience building through partnering could be more tangible if DHS internally systemized and partnered at the agency level.

According to Governor McCallum, some challenges to building community resilience cannot be solved through FEMA or DHS control, or through organizations such as Aidmatrix or the American Red Cross. The collaborative effort of all stakeholders, he stated, is the means to building resilience and is dependent on the ability of all to communicate, share, and work together to build community at the local level. He and others suggested that often some type of neutral entity is needed to facilitate collaboration, create tools, share information, and act as a resource and honest broker between the private sector, local communities, and different levels of government. The entity could be an organization or a tool that provides the means of creating mechanisms for sharing information and best practices. It could also provide the means of creating the social networks vital for effective communication and systems integration.

Diverse groups participating within a collaborative network do not necessarily have to like each other or know how to communicate well with each other. An honest broker serving as a facilitator could help prospective partners overcome these issues, build trust, and integrate resilience-building efforts. The challenge is identifying the entity or mechanism appropriate for each community.

Legislated Resilience

Some workshop participants noted that there is hesitancy in the private sector to become involved in private-public sector collaboration because of the fear of potential additional government oversight. Many in the private sector are already overwhelmed by government programs, regulations, and mandates. Some participants went as far as to say that programs such as the DHS Voluntary Private Sector Preparedness Accreditation Program[4] may detract focus and energy from where they are needed to create resilient businesses. They expressed the view that less regulation can be better because organizations know what they need to function on an ongoing basis. Others at the workshop countered that guidance from higher levels of government is necessary to ensure at least some level of disaster preparedness. Mary Wong of the Office Depot Foundation stated that numerous small and mid-size businesses close after a disaster, indicating that businesses may not know what they need to do to survive a disaster. Many companies and other types of organization may need assistance creating preparedness and continuity plans.

Liability

Maria Vorel of FEMA noted that federal public employees may avoid working with the private sector because of misinterpreted ethical guidelines for safeguarding against favoritism toward contractors. The small amount of training that federal employees receive encourages limited interaction with the private sector. This training and internal culture could dissuade government employees from collaboratively engaging with the private sector for the sake of building community resilience.

Chapter 2 described some of the concerns of those in the private sector with respect to liability. Some participants noted that there is concern and confusion as to whether Good Samaritan laws are applicable to businesses acting in good faith following a disaster should injuries occur. But liability is also an issue between local, state, and federal authorities. Leslie Luke of the San Diego County Office of Emergency Services pointed out that there is lack of knowledge of whether memoranda of understanding (MOUs) established between local jurisdictions and private organizations conflict or compete with state-level MOUs. In such circumstances, there is confusion about how liability is covered. It is not often understood if local MOUs are superseded by state MOUs, or whether local liability will be covered under a state umbrella. This confusion presents real barriers to effective collaboration and coordination and may create disincentives for the private sector (and government at various levels) to become involved.

Insurance

The Multihazard Mitigation Council report of 2005 was referenced several times by workshop participants (MMC, 2005). In it, the benefits of physical and process mitigation against disaster were calculated. The measure of resilience could have implications in

[4] See www.fema.gov/privatesector/preparedness/index.htm (accessed December 2, 2009).

terms of liability and insurance. Brent Woodworth of the Los Angeles Emergency Preparedness Foundation described his own experiences developing resiliency programs that reduced financial losses by over two-thirds per incident over a 10-year span. However this work was not accompanied by a change in insurance costs.

Within the building industry, groups such as the National Institute of Building Sciences[5] and the American Institute of Architects[6] have advocated performance-based building codes set against performance expectations. Pennie Bingham of the Charleston, South Carolina Metro Chamber of Commerce described similar efforts by a local business continuity and planning council representing different size businesses collaborating for different types of engagement. They advocate legislation encouraging insurance companies to provide incentives for contingency planning. Workshop participants discussed, however, that insurance companies have no incentive to lower their rates. It is less expensive for them to sell more insurance.

The International Center for Enterprise Preparedness at New York University[7] has explored the issue of insurance incentives, according to Debra Ballen of the Institute for Business and Home Safety. They released a white paper, *Insurance Incentives for Corporate Preparedness*, which focused on implementation and measurement capture (Raisch and Statler, 2006). The paper indicates which American National Standards Institute (ANSI) and National Fire Protection Association standards may prove to be useful criteria for companies in developing their emergency preparedness programs, and for underwriters in assessing the level of preparedness of policy holders.

Leadership

Sometimes even successful disaster resilience collaborations prove not to be sustainable or resilient. The loss of charismatic leadership can create a leadership vacuum; or formerly predictable sources of funding may fade away. It has already been discussed that a catalytic presence is often necessary to make collaboration happen. Many workshop participants suggested that it is essential, when the collaboration is established, to infuse the vision of the founding leadership into the collaboration itself. Institutionalizing the collaboration mission is important to ensure the sustainability of the partnership when individual leaders or circumstances change. Determining how to make this happen is a substantial challenge. Research on what leadership is and what it should look like in collaborations, how leaders engender trust and nurture the creation of a vision, and what engenders the confidence to empower others to help achieve the vision will provide information regarding how leadership for future successful and sustainable collaborative efforts can be nurtured.

[5] See www.nibs.org (accessed December 2, 2009).
[6] See www.aia.org (accessed December 2, 2009).
[7] See www.nyu.edu/intercep (accessed December 2, 2009).

LANGUAGE BARRIERS

The term "private-public partnerships" has been used for many years in the emergency management community, according to Jim Mullen, and a major challenge has been overcoming the language barriers and different focus among partners. The language used among those in the banking community, for example, is different from that used within the public health community. It is essential to breach language barriers so that effective communication may take place. For example, basic terms such as "resilience," "risk," and "community" were defined differently even among workshop participants well versed in topics related to resilience, disaster preparedness, and partnership building. Not defining the terms can be a barrier to effective collaboration, preventing identification of the needs of diverse people in a society. This is true for people from different professional sectors, social classes, and ethnic groups. Many workshop participants stated that resolving issues of semantics is essential so that a purpose and structure for the collaboration may be defined.

Some workshop participants observed that different interest groups may have difficulty communicating, even if similar outcomes are desired. Members of the business sector may not communicate effectively with, for example, members of non-profit or faith-based organizations. The public sector may not communicate well with the private sector. There is a need to find a common language that all will understand that will contribute to effective multiple-stakeholder partnerships. Several of those attending the workshop stated that research in this area may be helpful. During conversation at the workshop, many participants noted that the hierarchical, command-and-control style in language and approach with roots in law enforcement and the military in use by DHS may not be conducive to the encouragement of resilience-building collaboration. Monitoring and addressing this could be beneficial so that it complements ground-up collaboration at the community level.

Some workshop participants stated that partnerships between public sector organizations at the local level are just as important for community resilience collaboration as they are between sister agencies at the federal level. Claudia Albano of the City of Oakland described how the inability to coordinate between agencies at the local level creates inefficiencies and duplication of efforts and human resources within those agencies. As an example, she described how local police and fire departments may independently work to create separate neighborhood-level programs such as neighborhood crime watch or disaster safety groups. Ultimately they may end up competing for the attention of the same neighborhood residents. Coordination of the programs could result in gaining a wider audience for both efforts.

BUILDING TRUST

Trust is a fundamental factor essential to the formation of sustainable and effective collaboration. Trusted relationships are the capital that drive collaboration and build resilience. As Ron Carlee of Arlington, Virginia, stated, trust is organic and dynamic, and the nature of trust varies from community to community. Strategy and creativity need to be employed to build trust, and not a single formula or plan will work universally. A

vision and commitment are needed to bring people together in trust. Government agencies often spend money on hardware and supplies, but often do not consider trust and other human factors that are essential for the technology to be used to its potential. A lack of understanding of human factors prevent the most effective use of any technologies, methodologies, or strategies applied to building community resilience. Understanding the qualities of trust and how trust is built between collaborating people and organizations was considered important by many workshop participants. Understanding how trust is sustained, especially under stressful conditions, is equally important.

RESOURCE CHALLENGES

Workshop participants discussed how building community resilience generally enhances the social capital of a community. Better horizontal and vertical connections to those who have resources that can be utilized during a disaster are created. This is beneficial for all members of the community. However, several participants noted that it may be difficult to sell the concept of non-threat-based resilience through partnerships without the perception of threat. Political barriers at all government levels could deter resilience building efforts conducted without a hazard focus. In addition, they noted that funding for resilience-building collaboration is limited.

When asked what was needed to make private-public sector collaboration for community resilience building a national priority, Jim Mullen of the Washington State Military Department stated that all fledgling private-public programs across the country struggle with obtaining sustainable funding. Federal funding programs are often short lived, but collaboration and resilience building is a long-term process. Funding for long-term approaches to resilience building is difficult to obtain, in part because thinking in the long term is, in itself, not acknowledged as a critical aspect of program delivery, according to Ms. Vorel. Congress provides funds for the delivery of a successful program, but does not have mechanisms in place to appreciate processes such as collaboration, partnership development, and public education. Benchmarks are not readily available to justify resource requests for these types of expenditures. Jami Haberl of Safeguard Iowa Partnerships also pointed out the challenges imposed by the inflexibility of grants received from public sources. Restrictions on how dollars can be spent do not allow for the creative resource management sometimes needed to build and maintain partnerships. Additionally, administering public grants can be confusing and time-consuming.

Small and rural communities are often unable to participate in funding programs that require matching funds from the recipients because matching funds are unavailable, according to Adele Lyons. Some workshop participants said the private sector could be a source for funding, but multiple participants indicated hesitancy on the part of the private sector to provide financial support if the public sector is not doing so as well. Mickie Valente of the Florida Council of 100 suggested that incentivizing the private sector to participate in collaborations could also provide incentives for the private sector to provide financial support.

Fundraising on behalf of partnerships can be time-consuming. Those charged with facilitating partnerships may find all their time spent in search of funding rather than on

efforts that strengthen networks or facilitates resilience-building activities. Ms. Haberl also noted the circular nature of the fundraising activities. To gain the financial support of the private sector, outcomes are needed to demonstrate the potential return. However, without the support, no outcomes can be realized.

Many workshop participants agreed that more money and resources could alleviate some of the barriers to building resilient communities. Others stated that receiving more money is not likely in the foreseeable future and expressed, as Governor McCallum did, that a challenge exists in getting people to think beyond identifying the need for more money. Many agreed that a major challenge exists in building a culture that encourages creative funding, volunteerism among community members representing the full fabric of the community, and a community that focuses on results rather than mandatory processes.

INEFFICIENCIES

Topics in the next paragraphs have been discussed in greater detail elsewhere in the report, but are highlighted in this section on inefficiencies because of the extreme challenges they present to creating effective private-public sector collaboration for building community resilience.

Lessons Lost

Resilience-building systems seem to be event-driven rather than infused into the daily way business is conducted. Learning from experience and retaining knowledge for future applications is a challenge, especially as political administrations change. Lessons learned can be short-lived, and relearning lessons is inefficient.

Too Few Measures

The nation currently lacks an evidenced-based and politically acceptable nonprescriptive framework that helps communities as they work to build resilience. Workshop participants noted, however, that few measures of resilience exist and so it is therefore difficult to establish objectives and measures of success. Financial planning and resource allocation cannot be most efficiently accomplished without meaningful goals and metrics.

Poor Horizontal Communication

Inefficiencies may occur as a result of the command and control systems currently the norm in emergency management since 9/11. According to Ms. Vorel of FEMA, such systems are not supportive of collaboration and horizontal networking across public and private organizations. Communication using law enforcement or military vernacular, for example, is not conducive to collaboration, especially with respect to mitigation, but also for a broad range of emergency management activities.

INCLUDING THE ENTIRE COMMUNITY

Impoverished Communities

Workshop participants indicated a need to avoid focusing resilience-building efforts on a "generic" population of a community (e.g., middle-class, educated suburban dwellers). It is essential to consider and attend to the needs of all populations. Current governing systems at any level, for example, generally do not have plans to deal with communities in perpetual states of disaster due to poverty, crime, and violence. Building a nation of resilience requires moving communities beyond these perpetual disaster states. Members and organizations within these impoverished communities are a part of the full fabric of the community and need to be integral to collaborative efforts. Survivors within these communities can be important resources for the larger community when considering resilience because of their experiences living with disaster on a daily basis. By representing all members of the community in collaborative efforts, all members become empowered to be a part of decision making to create change. All members of the community could accrue the benefits of resilience-building efforts.

Community- and Faith-Based Organizations

The work of community- and faith-based organizations following a disaster was repeatedly called to attention. These groups often provide food, shelter, medical, hygiene, and other support services before emergency responders are even able to get into a stricken area. They often identify needs and fill the gaps in services otherwise not provided (Homeland Security Institute, 2006). These groups are often underrepresented in private-public sector collaborations, in many cases because they do not readily fit into the silos filled by other types of organizations. Determining how to most effectively engage and include community- and faith-based organizations in resilience-building efforts is a great organizational challenge.

CREATING VERSUS CONTROLLING THE ENVIRONMENT FOR CHANGE

Prescriptive mandates from the federal government are often not conducive to grassroots community-level collaboration. Workshop participants indicated that it is not federal control that is needed to create change, but a national movement supported by the federal government that can create the environment that instills more responsibility for resilience building at the community level.

Culture change is possible and there are case studies of communities that are building resilience through culture change. Brent Woodworth described activities in Tulsa, Oklahoma where grassroots collaborative efforts encouraged builders to include safe rooms as a showcase in new homes being built in one of the highest tornado-prone regions in the country. Over time, many consumers came to expect that they would only buy in the area if the home included a safe room. This change in cultural environment came without prescriptive mandates from government. However, Ann Patton of Tulsa Partners, Inc. (retired), did clarify that safe rooms will likely not be found in "low-end" housing, or that the need for safe rooms will be recognized for long if the community is not continually reminded in meaningful ways of the risks associated with tornadoes.

Comprehensive community planning should incorporate disaster preparedness planning as part of its overall efforts. Ms. Valente described post-disaster redevelopment plans in Florida that are now being included as part of comprehensive land-use planning. These plans are being encouraged by the business community and Florida legislature for the state's coastal communities. This is being done in the same way that good business plans are encouraged to include contingency plans. The plans include not only land-use considerations and issues associated with built infrastructure, but also planning associated with environmental, communications, and other factors. These are umbrella plans in which all other local mitigation strategy plans can fit. Ms. Valente admitted, however, that the tools and analyses are not available to deal with the economic component of the plan. Such community planning could promote connectivity among community members, according to Ron Carlee of Arlington County, Virginia. Land-use planning done in such a way as to build physical communities that are resilient and sustainable could result. Governor McCallum warned, however, of the need for careful planning. Solving some problems, such as bringing people closer to public transportation, may increase the likelihood of other problems, such as pandemic spread of illness.

A social environment conducive to building community resilience from the ground up needs to support organic growth, flexibility, and the needs of all community stakeholders. The environment would allow relationships to be built on trust. As collaborative structures are established, there is a need to determine how to make them sustainable. The most effective solutions developed within these structures are scalable to the different needs of the community. To achieve essential resilience, networks need to take advantage of social revolutions such as social networking that occurs among the younger generations. Collaborations and their members are challenged to be flexible enough to recognize and absorb changes experienced through evolution or driven by events.

4

Potential Research

Workshop participants discussed a range of issues associated with private-public sector collaboration to enhance community disaster resilience. Issues included those related to the best means of initiating and sustaining private-public sector collaboration, metrics for measuring success of collaborative efforts, and cultural and behavioral factors that impact the success of collaborative efforts. Chapter 3 summarizes workshop discussion related to barriers to effective and sustainable collaboration. Overcoming these barriers could be informed by appropriate research. Research findings from other disciplines may inform research related to collaboration for community disaster resilience, but some areas may not have been adequately researched. This chapter organizes many of the research questions raised during workshop discussion into thematic areas.

RESEARCH THEMES AND TOOLS

Best Practices

Several workshop participants stated that no single model or methodology will work for all communities attempting to develop sustainable collaborations for resilience building. Each community must take an approach that is most meaningful and relevant to meets its needs, history, traditions, and composition. According to several workshop participants, an important tool to help support emerging (and ongoing) collaborations in the development of their networks would be a freely accessible repository of knowledge, best practices, and subject-matter expertise from around the world. The repository could best be facilitated by a neutral party that represents the interests of all stakeholders. Tools to access the repository need to be simple, and methodologies presented need to be actionable, understandable, and scalable. Successes need to be exemplified because, as Mary Wong of the Office Depot Foundation expressed it, nothing succeeds like success.

Having a compendium of best practices, however, is not the complete solution to creating a culture of resilience. Simply referring to the compendium is not a sufficient

response to communities needing or requesting assistance in the development of resilience-building collaborations. One research priority described by some participants is research that could result in or inform the development of tools and templates that encourage and assist in planning business preparedness and mitigation processes. Some tools do exist, such as those of the Institute for Business and Home Safety[1] and the business portal of Washington State's Emergency Management website.[2] The latter, according to Mr. Mullen, was chosen by the National Emergency Managers Association as an example of best practices.[3]

Research on lessons learned at the community level from previous disasters, in terms of both success and failure, are especially important. Frank Reddish of the Miami-Dade County Department of Emergency Management and Homeland Security described experiences of those in South Florida following Hurricane Andrew in 1992. Entire communities were destroyed but came back together. Mr. Reddish suggested that research on what contributed to the success of these and similar communities could be an asset to those looking for effective resilience building strategies.

Participants repeatedly suggested the need to create a catalog of best practices but were not clear about what organizations could address this need. Many agreed that whatever organizations filled this role would have to be a neutral entity with credibility among all stakeholders. Many participants stressed this function could best be fulfilled by an agency other than the Department of Homeland Security (DHS) or other funding agency, in large part because people may be disinclined to share unsuccessful efforts with their funders. It was considered essential that the eventual mechanism be a forum considered safe from punitive action. Several observed that the Lessons Learned Information Sharing national network of best practices for emergency response established by FEMA[4] is useful, but not the neutral facilitative mechanism needed. It will not likely become the tool envisioned by workshop participants.

Metrics

Progress is a vector. To successfully measure or evaluate progress, the starting and desired endpoints have to be defined. Several participants indicated that advancing the understanding and use of collaborative approaches to disaster resilience at the community level will require research that informs how one could quantify the benefits and effectiveness of the efforts. Participants asked what needed to be measured, and how resulting metrics could be used to encourage further resilience-building efforts.

Over the course of the workshop, the need for several types of metrics was identified. These ranged from those for evaluating partnerships themselves to those measuring the resilience of communities more generally, especially as a result of collaboration. The application of metrics is important from both the scientific and practical points of view, for example in determining which methodologies are most effective and under what circumstances. Metrics can also be used by funding agencies to justify that grant dollars

[1] See www.disastersafety.org (accessed December 2, 2009).
[2] See www.emd.wa.gov/preparedness/prep_business.shtml (accessed December 2, 2009).
[3] See www.nemaweb.org/home.aspx (accessed December 2, 2009).
[4] See www.llis.dhs.gov/index.do (accessed December 2, 2009).

are well spent. Being able to cite progress or success in efforts can be a good tool for mobilizing private-sector participation and investment.

Metrics for Measuring Partnerships

Randolph Rowel of Morgan State University suggested that science for evaluating partnerships exists and is being applied, for example in the public health community. The Substance Abuse Mental Health Services Administration Center for Substance Abuse and Prevention[5] Community Partnership and Coalition programs, for example, have conducted rigorous cross-site evaluation of partnerships they fund using outcome data from 24 randomly selected partnerships and have matched comparison communities identified on the basis of age, gender, ethnicity, size and density of population, income levels, and geographic proximity of the jurisdiction. Community Coalition Action Theory (Butterfoss and Kegler, 2002) was applied as the comprehensive framework for coalition development and functioning. Their approach and other public health approaches could be explored to identify different means of evaluating the effectiveness of partnerships.

Certain aspects of partnering and collaboration are difficult to measure, such as the levels of trust generated between network members, or the levels of acceptance of collaboration goals. The tools of social network analysis, as described in an earlier NRC workshop summary (NRC, 2009), may provide a means of measuring these less tangible qualities. Research on the social measures that would be most indicative of successful partnerships, and the development of tools to measure them, may prove beneficial.

Metrics for Measuring Community-Level Resilience

It can be relatively straightforward to measure physical aspects of resilience such as those associated with physical infrastructure. It is more difficult to measure the outcomes of resilience-building efforts in terms of disaster preparedness, emergency management, and community quality of life without a thorough base-level understanding of a community at the beginning of any improvement process. As Maria Vorel of FEMA pointed out, however, movement toward resilience will often be incremental and may not be linear. Tools to measure resilience-related goals are not well developed or utilized.

Difficult to measure are what workshop participants termed the "soft tissue" changes in a community. These are associated with accumulated sociological benefits such as changes in a community's capacity to absorb change that result from public education and partnership development campaigns. Desired outcomes may be the impetus of the cultural shifts and attitude changes related to the concept of resilience. It may be difficult to measure such outcomes against absolute standards. Tools developed in other disciplines could be modified for measuring progress in building resilience according to some workshop participants. Social network analysis was again suggested as a possible means of measuring soft-tissue change.

Some participants identified research by several government agencies seeking to measure resilience. The Economic Development Administration of the Department of

[5] See www.prevention.samhsa.gov (accessed December 2, 2009).

Commerce, for example, has been conducting research and developing tools for measuring economic resilience, according to M. John Plodinec of the Savannah River National Laboratory. Dr. Plodinec also described resilience-related research conducted by the U.S. Department of Agriculture. Some workshop participants again cited research from the public health community as a potential resource. Compiling research conducted within the federal and lower levels of government could reveal tools that have already been developed and are in use, and may inform practitioners involved in resilience-building efforts about how they may better target their own efforts.

Overcoming Organizational Silos

Some participants expressed frustration about the tendency for organizations, in both the public and private sectors, to exist in separate and independent silos, creating an environment unsupportive of collaboration. A more holistic approach for resilience building was considered by these participants to be more productive. Research conducted to understand how community educational, public health, workplace, transportation, and communications systems could operate and fit together could be beneficial. Understanding how the web of formal and informal relationships that comprise a community's civic infrastructure supports all aspects of a community, particularly when under stress, is an essential element for building community resilience, according to multiple participants. Research findings could help city managers and collaboration partners determine how to work more efficiently and measure progress toward common goals. Understanding networks within civic infrastructure could inform the creation of community planning processes that promote economic and environmental sustainability. Broad support from the community, according to many workshop participants, may be more likely under such circumstances.

Communicating with organizations that exist in silos can be challenging. Jill Labbe of the Fort Worth Star-Telegram observed, however, that editorial boards of many community newspapers often have ongoing relationships with the leaders and members of many such organizations. She observed that the press could be considered an asset to collaborative efforts, rather than an adversary, and could serve a role in building community disaster resilience. Some workshop participants suggested that national media outlets may not feel integrated and may be reluctant to participate in community-level endeavors. On the other hand, local media outlets are community members and stakeholders in resilience building and recovery efforts. They could potentially enhance efforts to communicate across organizations.

One challenge in reaching out to different types of organizations is overcoming issues associated with different time cycles in which the private and public sectors may operate. Public servants often work on timescales corresponding to election and budget cycles, whereas businesses may think in terms of annual or quarterly benefits. Questions were raised by some workshop participants regarding how to encourage all interest groups to plan on longer-term time horizons. This could be useful in terms of partnership sustainability and in terms of maintaining institutional memory of collaborative and resilience-building successes.

Incentivizing Community-Level Involvement

Getting grassroots-level involvement during all phases of collaboration for resilience building was considered an important aspect of building a culture of resilience by many workshop participants. Though it is often community-level organizations that respond first in emergencies to provide shelter, food, and other basic necessities, uncertainty often exists, regarding how faith-based and community-level groups can be categorized. These groups may not regularly communicate with either the public sector or the business communities, sometimes because of a lack of trust.

Underserved populations may include segments of a community that live with disaster on a daily basis. They often have systems and services in place for day-to-day living. Researching and understanding these systems may provide information to more effectively serve the populations at risk, and may prove beneficial to the community as a whole. The community benefits from considering populations at risk as resources and drawing them into resilience-building collaboration. This in turn empowers these groups to become more resilient and healthier.

There is a need to understand how to incentivize participation in private-public sector collaboration among all groups including community and faith-based organizations, small business owners, underserved populations, and volunteers. Research on how different peer groups can be incentivized, including how partnership agendas can be reframed to be more inclusive, may help collaborations bring these groups in.

Incentivizing Business Participation

Incentivizing business participation in collaborative efforts involves being able to communicate with those in the business sector using meaningful language and methodologies. The concept of developing a business prospectus for building community disaster resilience through private-public sector partnership was discussed in Chapter 2 of this report. Aside from identifying the right operating models, it is essential to identify the right economic models to be applied. Many different models exist, but questions arose about how to identify those that would be most sustainable or scalable within a given business community and therefore more attractive for the business community. Further incentive to business participation could be the knowledge of the real cost of business shutdown due, for example, to lack of electrical power following a disaster. Available data on this topic are limited, but could possibly be persuasive.

Because management is not only about management structure, it is also important to study the human factor issues that need to be incorporated into different models.

Establishing Bases of Information

Partnership Models

Establishing and applying metrics was considered by many workshop participants to be largely dependent on establishing bases of information from which to draw. Some workshop participants stated that case studies of effective partnerships can be an important means of establishing that base. Longitudinal studies to understand how partnerships did or did not function under different circumstances, on how they were made sustainable, or how they failed are also means, according to some workshop participants, of creating a body of knowledge on best practices for building sustainable partnerships. Comparison studies of different partnerships and their infrastructures could identify factors critical to sustainable collaborative efforts.

Organizational effectiveness models were suggested as useful by some participants. Research on effective models for collaboration and partnership within government, the private sector, and in private-public sector collaboration were also described as important by various workshop participants. Some described the need to quantify this research in structured ways. Additionally, the importance of understanding the economic impacts of various approaches and models was noted by some.

Identifying Existing Networks

Identifying and utilizing existing social networks in a community was described by multiple workshop participants as essential for communicating and engaging all members of the community. Research on how to use social networking tools to identify and reach out to all community stakeholders in order to strengthen network connections was identified as an important area of study. Social network analysis could be applied to understand how networks change with time or under stress, or how existing networks can collaborate and build new networks effective at building resilience. Such analyses could also prove useful to understand how large a network or partnership needs to be in order to achieve desired outcomes, or how networks might change scale when under stress.

Time-Series Studies

Assessing resilience levels of regions at different times could provide valuable information, according to some workshop participants. The resilience of any region or community constantly changes because communities constantly change. Determining the means to monitor and measure in what ways and under what circumstances a community's ability to respond to disaster changes could help communities be better prepared, according to some workshop participants. Regional assessments over time may provide important base information for assessing capacity for disaster response.

Time-series research on disaster recovery could also be of benefit, according to multiple workshop participants. Studying what has happened 10 years, 15 years, and 20

years after, for example, Hurricanes Andrew and Katrina, were repeatedly mentioned as potentially useful. Quantifying the losses of all sectors of government and the community affected could provide data for recovery effectiveness methodology models.

Some workshop participants described the usefulness of understanding what happens following a disaster in secondary cities—those indirectly impacted by a disaster. Understanding, for example, how Hurricane Katrina affected collaborative efforts and general resilience of cities such as Lafayette, Louisiana, Houston, Texas, or Memphis, Tennessee over time could be important. Though these cities were not physically damaged by the storm, their resilience was tested and resources were stretched thinly by the influx of evacuees in grave need of services. Collaborative efforts in secondary cities can be easier to facilitate because infrastructure is more likely to remain intact.

Behavioral and Sociological Characteristics

Behavior Under Stress

Questions were raised by workshop participants regarding the behavior of community citizens as individuals and as members of collaborations under stress. Workshop participants indicated that research may help inform the development of models to predict behavior of people and organizations given specific scenarios or disasters. Research may also inform the modeling of emergent behaviors. Given a scenario or situation researchers could model how people and communities have reacted and will react, thereby gaining insights into the emergent behavior of people in a host of situations. Understanding such behavior could help collaborations mitigate, track, or respond positively to predicted behaviors, potentially increasing resiliency and rates of recovery. Mr. Reddish described how understanding motivations behind certain behaviors, such as the ignoring of evacuation orders, could inform how information could be disseminated more effectively.

Ownership Claims

Ellis Stanley wondered how to avoid claims of ownership of collaborative processes by individuals or entities. Other workshop participants agreed this was an issue, and many stated that decisions related to collaborative processes may best be within the collaboration. Whereas volunteers are praised for taking responsibility for resilience-building and response efforts, working through the collaborative infrastructure may make it more likely that actions are in the best interest of the community. Understanding this type of behavioral dynamic, according to many workshop participants, may provide insights on how to harness energies into productive collaborative approaches.

Targeting Communication Based on Behavior

Understanding how different community members and organizations behave under stress could allow the effective targeting of educational processes. Understanding social behaviors could also contribute to the understanding of the characteristics of socially effective communication, potentially maximizing efforts to reach and sustainably engage potential collaborators. Understanding technologies and communication techniques such as social networking tools could enhance communication, according to some workshop participants.

Building Capacity

Workshop participants identified an array of research areas that could fill gaps in knowledge regarding the building of community and individual capacities necessary for resilient communities. Questions raised by some participants included:

- What kinds of technical training, assistance, and outreach are needed to enable sustainable communities?
- Should the public sector or a brokering organization implement training?
- How are collaboration skill sets built at the community level?
- What kind of training builds leadership qualities in individuals?
- How can creativity and innovation be fostered?
- How do collaborative networks engage the younger generation, pre-Generation X, in order to benefit from its expertise and sustain collaborative efforts in the long term?

Many workshop participants discussed how in order to realize a cultural shift in thinking about resilience, the concept of resilience could be incorporated into curricula at colleges, universities, and professional and law schools where the next generation of business leaders, public managers, and managers of nongovernmental organizations are being trained.

Shirley Laska of the University of New Orleans described Hazard Mitigation Grant Program funding received by the state of Louisiana to inculcate resilience into different parts of their curriculum. Faculty members' salaries are supplemented to incorporate resilience pedagogy, such as best practices, into curriculum and classes. Evaluation of the effectiveness of this program is part of the grant. Louisiana is working with the American Planning Association to include disciplines, such as education, business, and civil engineering into the program. Some workshop participants described how it is essential that programs such as this are monitored and expanded if proven successful.

Some participants noted that another model for increasing capacity is through

mentoring programs. Individuals from one community assist other communities in identifying, for example, missing elements for successful collaboration. Mentoring of communities by communities may drive momentum, and may provide examples that lead to replication of success. In this way, institutional knowledge can be shared from around the country. This was the desired outcome of the Project Impact program (see Box 2-2). Study of the effectiveness of mentoring programs, according to some workshop participants, may inform such programs on how to improve.

FUTURE RESEARCH MECHANISMS

The results of research are often poorly translated to practitioners. One way research could be more effectively translated to practitioners is by building research directly into the mission of private-public sector collaborations, according to some workshop participants. Doing so could increase community capacity for resilience and inform collaborative activities with information in real-time on how best to modify goals, objectives, and activities. However, as many at the workshop noted, researchers are generally not included in collaboration at the community level.

Participants of a recent workshop on the use of social network analysis for building community disaster resilience suggested building regional collaboratives among local universities, agencies, and businesses (NRC, 2009). Local, state, and federal resources could be used to establish the collaboratives to encourage thorough baseline expertise on regional social networks and their capacities for building resilience. Regions could be consistent, for example, with the 10 regions into which FEMA currently divides the United States, and could serve as repositories for regional baseline data and resources for federal and local response agencies during disasters.

Some regional collaborations as described above already exist in some form, and seem to be more effective if they are compilations or alliances of existing collaborations, according to Lynne Kidder of Business Executives for National Security. Some workshop participants referred to the Regional Integrated Sciences and Assessments program of the National Oceanic and Atmospheric Administration as an example of a program that funds research collaborations between university researchers and the private and public sectors studying regional adaptation to climate change (Pulwarty et al., 2009).

Scientists have called for the establishment of a new National Science Foundation observatory called RAVON, the Resiliency and Vulnerability Observing Network (Peacock et al., 2008). This could be a social science analog to the National Ecological Observing Network (NEON) which provides scientific information about continental-scale ecology obtained through integrated observations and experiments contributing to understanding and decision making regarding the changing environment.[6] Some workshop participants expressed that a national observatory network such as RAVON could serve resilience science through the development of data collection protocols across different sociopolitical environments and different hazards, supporting the development of long-term longitudinal datasets, enhancing data-sharing capabilities among researchers and practitioners.

[6] See www.neoninc.org/ (accessed December 2, 2009).

RESEARCH FUNDING

In discussing sources of funding for research on effective collaboration for community resilience, many workshop participants noted that much of the research described as necessary is applied in nature, and not of the type that can be funded by, for example, the National Science Foundation. A different type of funding stream could better support the kind of research described as beneficial. Additionally, government often spends money on the development of technology, hardware, and supplies, but better support of resilience-building efforts might be achieved if funds could support research on the behavioral and sociological factors that influence the effective use of the technologies. Regardless of the source, however, many workshop participants described how research funding was often too short-lived for the type of research described as beneficial.

A NATIONAL AGENDA TO SUPPORT COLLABORATION

Many workshop participants identified the need to create a culture throughout the nation that promotes collaborative community resilience-building efforts. To build community resilience, it is essential to move from a system focused on response to disasters, toward a framework that is informed and guided by the principles of resilience building. As Paul Jack of the Bay Area Preparedness Initiative of the Fritz Institute described it, DHS and all other agencies could benefit if they were to establish private-public sector collaboration for building communities as a true national priority so that such collaborations could organically grow throughout the country. A clearly stated national goal could create a focus on the importance of this issue that has been lacking to date.

According to Brit Weber of Michigan State University, explicitly including private-public sector partnerships as part of a plan to build resilience has been an effective means of creating a focus necessary to build resilience at the state level. Many workshop participants agreed that this could be effective at the federal level as well. It was stated repeatedly throughout the workshop that shifting cultural expectations with respect to resilience could be accomplished if creating a culture of resilience were to become a national priority across all agencies.

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Appendix A

Committee Biographies

William H. Hooke *(Chair)* is a senior policy fellow and the director of the Atmospheric Policy Program at the American Meteorological Society (AMS) in Washington, D.C. Prior to arriving at AMS in 2000, Dr. Hooke worked for the National Oceanic and Atmospheric Administration (NOAA) and antecedent agencies for 33 years. After 6 years of research with NOAA he moved into a series of management positions of increasing scope and responsibility including chief of the Wave Propagation Laboratory Atmospheric Studies Branch, director of NOAA's Environmental Sciences Group (now the Forecast Systems Lab), deputy chief scientist, and acting chief scientist of NOAA. Between 1993 and 2000, he held two national responsibilities: director of the U.S. Weather Research Program Office, and chair of the Interagency Subcommittee for Natural Disaster Reduction of the National Science and Technology Council Committee on Environment and Natural Resources. Dr. Hooke was a faculty member at the University of Colorado from 1967 to 1987, and served as a fellow of two NOAA Joint Institutes (CIRES, 1971-1977; CIRA 1987-2000). The author of over 50 refereed publications and coauthor of one book, Dr. Hooke holds a B.S. (physics honors) from Swarthmore College (1964), and S.M. (1966) and Ph.D. (1967) from the University of Chicago. He chaired the National Academy of Sciences/National Research Council (NAS/NRC) Disasters Roundtable from 2003-2009, has served on numerous NAS/NRC committees, and was named an NAS/NRC National Associate in 2008. In 2006, he was elected a member of the American Philosophical Society.

Arrietta Chakos is project director of the Harvard Kennedy School's Acting in Time Disaster Recovery Research Project and previously served as assistant city manager in Berkeley, California, directing innovative hazard mitigation initiatives. The Acting in Time Disaster Recovery Research Project focuses social and governmental interventions to reduce disaster risk and by supporting communities to responsibly implement safety measures. Ms. Chakos has worked with the Federal Emergency Management Agency (FEMA) and the California Office of Emergency Services on hazard mitigation programs. She has served as a technical advisor for FEMA on risk mitigation and disaster loss estimation. She has advised GeoHazards International, the Organization for Economic Cooperation and Development (OECD), the World Bank, the California Office

of Emergency Services, the Association of Bay Area Governments, and the Center for BioSecurity on disaster and community engagement issues. She is a committee member of the NAS/NRC Disasters Roundtable. . Publications include papers on disaster issues for numerous technical conferences on disaster risk reduction; for the American Society of Civil Engineers; for Spectra, a professional publication; and for the Natural Hazards' Observer. She contributed a chapter to OECD's book, *Keeping Schools Safe in Earthquake Country* and to *Global Warming, Natural Hazards, and Emergency Management* (2008). Ms. Chakos received a B.A. in English from California State University, Humboldt, and a M.P.A. from the Harvard University Kennedy School of Government.

Ann-Margaret Esnard is a professor and director of the Visual Planning Technology Lab (VPT Lab) at Florida Atlantic University (FAU) School of Urban and Regional Planning. Dr. Esnard's expertise encompasses geographic information systems (GIS)/spatial analysis, coastal vulnerability assessment, displacement vulnerability, land-use planning, and disaster planning. She has been involved in a number of related research initiatives and is the principal investigator for a 3-year National Science Foundation grant to study hurricane-related population displacement, housing, and land development policy issues in eight coastal states (North Carolina to Texas). She has written on topics that include vulnerability assessments of coastal and flood hazards, population displacement vulnerability, quality of life and holistic disaster recovery, environmental justice, spatial analysis, GIS education, and public participation GIS,. Dr. Esnard has served on a number of local, state, and national committees including the Steering Committee for Evaluation of the National Flood Insurance Program directed by the American Institutes for Research on behalf of FEMA; the Disasters Roundtable of the National Academy of Sciences; the review committee for the Institute for Business & Home Safety's Award for Scholarship in Planning and Natural Hazards. She is currently a member of the State of Florida Post-Disaster Redevelopment Planning Initiative. Dr. Esnard holds degrees in agricultural engineering (B.Sc., University of the West Indies-Trinidad), agronomy and soils (M.S., University of Puerto Rico-Mayaguez), and regional planning (Ph.D., University of Massachusetts, Amherst). She also completed a 2-year postdoc at University of North Carolina, Chapel Hill.

John R. Harrald is a research professor and adjunct professor of public policy at the Virginia Polytechnic Institute and State University Center for Technology, Security, and Policy. He is the director emeritus of the George Washington University (GWU) Institute for Crisis, Disaster, and Risk Management and professor emeritus of engineering management and systems engineering at GWU. Dr. Harrald is a member and chair of the National Research Council Disasters Roundtable Steering Committee, and a member of the Center for Disease Control and Prevention Board of Scientific Counselors. He served as a member of the National Research Council Transportation Research Board Aviation Emergency Management Task Force. He is the executive editor of the electronic *Journal of Homeland Security and Emergency Management* and associate editor of *The International Journal of Emergency Management.* He is the immediate past president of the International Emergency Management Society. He has been engaged in the fields of emergency and crisis management and maritime safety and security and as a researcher in his academic career and as a practitioner during his 22 year career as a U.S. Coast Guard officer, retiring

in the grade of Captain. Dr. Harrald received his B.S. from the U.S. Coast Guard Academy, a M.A.L.S. from Wesleyan University, an M.S. from the Massachusetts Institute of Technology where he was an Alfred P. Sloan Fellow, and an M.B.A. and Ph.D. from Rensselaer Polytechnic Institute.

Lynne Kidder is the senior vice president for public-private partnerships at Business Executives for National Security (BENS), a nonpartisan, nonprofit organization dedicated to applying best practices of the business sector to help make America safe and resilient. Ms. Kidder directed BENS' national *Business Force* partnership program, facilitating public-private collaboration to strengthen homeland security and all-hazards disaster resilience at the state and local level. In addition to working on related federal policy, she continues to advise new and prospective partnerships. In 2008-09, Kidder led a BENS-convened coalition of national business leaders, professional/trade organizations, academics, NGOs, military, and agency partners, to build consensus on a framework for effective public-private collaboration at all levels of government. She is a member of the National Homeland Security Consortium and the Institute of Medicine's *Forum on Medical and Public Health Preparedness for Catastrophic Events* – co-chairing its working group on countermeasure dispensing. Kidder's previous experience includes executive level management in state government, corporate government affairs, and eight years as professional staff in the U.S. Senate. Prior to joining BENS in 2005, she served as the executive director of a non-profit organization of C-level executives in northern California, where she led numerous collaborative initiatives between private employers, public officials and other civic leaders. Kidder holds a BA from Indiana University, and a master's degree from the University of Texas at Austin, and did additional post graduate study in Public Administration at George Mason University.

Michael T. Lesnick is a cofounder of and senior partner at Meridian Institute, a nonprofit organization that provides neutral conflict management and multiple-stakeholder collaborative problem-solving services domestically and internationally. Dr. Lesnick has over 30 years of experience designing and managing multiparty information-sharing, problem-solving, and conflict management processes. His work with decision makers and stakeholders from government, corporations, nongovernmental organizations, international institutions, and scientific bodies has resulted in bringing practical solutions and new private-public partnerships to some of society's most controversial and complex problems, particularly in the areas of national and homeland security, environment and sustainable development, public health, food security, climate change, international development, and science policy. Dr. Lesnick facilitated the White House Hurricane Katrina Stakeholder Summit as well as interagency and stakeholder processes in the development of the National Infrastructure Protection Plan and the National Response Framework. He directed projects that resulted in the formation of nine critical infrastructure/key resource sector coordinating councils at the national level as well as pandemic planning processes for the Department of Homeland Security Office of Infrastructure Protection. Dr Lesnick works extensively with the Community and Regional Resilience Institute. He has been the project director of over 100 domestic and international multiple-stakeholder collaboration processes. Dr. Lesnick has published in the areas of facilitation, mediation, and strategy assessment. He holds an M.S. and a

Ph.D. from the University of Michigan where he was also a postdoctoral fellow in environment and collaborative problem-solving and conflict management.

Inés Pearce is chief executive of Pearce Global Partners Inc. (PGP), addressing the needs of government, business, nonprofits, and communities to reduce the potential for loss of life and property from natural and human-caused disasters. Ms. Pearce is a business continuity and emergency management expert with 17 years of professional experience, including 12 years specializing in private-public partnerships. She serves as the senior disaster response advisor for the Business Civic Leadership Center (BCLC) of the U.S. Chamber of Commerce, where she is BCLC's primary point of contact for community-level disaster preparedness, recovery, and partnership coordination. She has also served as a U.S. Chamber of Commerce liaison during disasters, to facilitate long-term recovery, such as 2010's earthquake in Haiti, the American Samoa tsunami in 2009, and 2008's flooding in Iowa, storms in Florida, and hurricanes in Texas and Louisiana. Before launching PGP, Ms. Pearce was appointed as Seattle Project Impact director for the City of Seattle Emergency Management, managing four mitigation programs that provided resources for safer schools, homes, and businesses, as well as better hazard maps. During her tenure, Seattle Project Impact received numerous national excellence awards. As an expert in private-public partnerships, Ms. Pearce has represented the World Economic Forum at the United Nations (UN) Global Platform for Disaster Risk Reduction in Geneva, Switzerland, and has addressed the United Nations regarding private-public partnerships at the World Conference for Disaster Reduction in Kobe, Japan. In 2003, Ms. Pearce was inducted into the Contingency Planning & Management Hall of Fame in the Public Servant category. She has also received two National Excellence Awards from the Western States Seismic Policy Council and in 2009 received an Award of Recognition from the city of Los Angeles for the successful planning of the Great Southern California ShakeOut, the largest earthquake drill in U.S. history with 5.5 million participants. Ms. Pearce is president of the Disaster Resistant Business Toolkit Workgroup, a 501c-3 public charity, which provides a comprehensive tool designed to assist small businesses create and implement improving their disaster readiness plans; the Contingency Planning & Recovery Management group; and on the Board of the Cascadia Regional Earthquake Workgroup. She received her B.A. degree in political science from Gonzaga University.

Randolph H. Rowel is an assistant professor and director of the Why Culture Matters Disaster Studies Project at the Morgan State University School of Community Health and Policy. Dr. Rowel has over 25 years' experience in community health education with considerable expertise in community organizing and empowerment, partnership development, and social marketing. He teaches Community Needs and Solutions, Community-Based Participatory Research, and Qualitative Research in Public Health and has been an invited presenter at numerous emergency management–related conferences to speak on community engagement and the cultural implications of disasters. Dr. Rowel serves as an investigator for the Department of Homeland Security–funded National Center for Preparedness and Catastrophic Event Response (PACER), where he is conducting studies to examine the relationship between daily crisis and preparedness behavior and community engagement strategies for low-income populations. As a

PACER investigator, Dr. Rowel is also developing culturally appropriate disaster preparedness curriculum for faith-based leaders. In partnership with Maryland Department of Health and Mental Hygiene, Dr. Rowel recently completed a project that examined knowledge, perceptions, and natural disaster experiences of low-income African American and Spanish-speaking Latino populations. This initiative led to publishing a *Guide to Enhance Grassroots Risk Communication Among Low-Income Populations*, which provides practical, step-by-step instructions on how to work with grassroots organizations in order to deliver critical information to low-income populations before, during, and after a disaster. Dr. Rowel recently served on the National Academies' Ad Hoc Committee to Plan a Social Network Analysis (SNA) workshop. The workshop examined the current state of the art in SNA and its applicability to the identification, construction, and strengthening of networks within U.S. communities for the purpose of building community resilience. He received his undergraduate degree at Morgan State University and his master's and doctoral degrees from the University of Utah and the University of Maryland, College Park, respectively.

Kathleen J. Tierney is a professor of sociology and director of the Natural Hazards Research and Applications Information Center at the University of Colorado, Boulder. The Hazards Center is housed in the University's Institute of Behavioral Science, where she holds a joint appointment. Dr. Tierney's research focuses on the social dimensions of hazards and disasters, including natural, technological, and human-induced extreme events. She is senior author of *Facing the Unexpected: Disaster Preparedness and Response in the United States* (Joseph Henry Press 2001), co-editor, with William Waugh of *Emergency Management: Principles and Practice for Local Government* (International City and County Management Association 2007), and author or co-author of several dozen journal articles and book chapters on disaster-related topics. Prior to joining the faculty at the University of Colorado, she was a professor of sociology at the University of Delaware, where she directed the Disaster Research Center. Her current and recent research includes projects focusing on warning systems for extreme weather events; disaster preparedness among community-based and faith-based organizations serving vulnerable populations; the structure of local inter-organizational networks for terrorism preparedness; vulnerability analyses of interdependent critical infrastructure systems in California's Northern Delta; and flood hazard vulnerability and preparedness in the Netherlands. Tierney has served as a member of the National Academies/National Research Council Committee on Disaster Research in the Social Sciences and the Panel on Strategies and Methods for Climate-Related Decision Support. She is a current member of the Panel on Informing Effective Decisions and Actions Related to Climate Change, which is part of the "America's Climate Choices" study. In 2006, she was the recipient of the Earthquake Engineering Research Institute's Distinguished Lecturer award, the only sociologist and the first woman to receive that honor. Tierney received her Ph.D. in sociology from The Ohio State University and subsequently held a 3-year NIMH postdoctoral fellowship at the University of California Los Angeles. Her other academic and research appointments include positions at the California Seismic Safety Commision, the University of Southern California and the University of California at Irvine.

Brent H. Woodworth is currently president and chief executive officer (CEO) of Los Angeles Emergency Preparedness Foundation. He is a well-known leader in domestic and international crisis management with a distinguished history of working in partnership with government agencies, private sector companies, academic institutions, faith-based organizations, and nonprofits. In December 2007, he tretired from IBM Corporation after 32 years of service which included the development and management of all worldwide crisis response team operations. Over the past several years, Brent has led his "Crisis Response Team" in response to over 70 major natural and human-caused disasters in 49 countries. Brent's domestic response efforts include the 1992 civil unrest in Los Angeles followed by the 1994 Northridge earthquake, Oklahoma City bombing, 9/11 World Trade Center attacks, Hurricane Katrina and multiple flooding, wind, fire, and seismic events. In 1998, Brent was appointed by Federal Energency Management Agency Director James Lee Witt to serve on a U.S. congressionally designated committee where he coauthored the national plan for predisaster mitigation. Brent has continued to demonstrate his industry leadership by serving on national and local committees and boards including the National Institute of Building Sciences board of directors; the U.S. Multi-hazard Mitigation Council (MMC) as chairman; the Advisory Committee on Earthquake Hazards Reduction (ACEHR) board of directors; and as the Los Angeles Emergency Preparedness Foundation president and CEO. Brent is the recipient of multiple industry awards and a well-published author on disaster preparedness, private-public partnerships, and crisis events. One example of Brent's private-public sector collaboration focus includes his successful negotiation with Starbucks Corporation and T-Mobile Inc. whereby they provided free wireless connection service at over 1,000 locations from Santa Barbara to the U.S.-Mexico border during the California wild fires in October 2007. He received his B.S. in marketing management from the University of Southern California.

Appendix B

Workshop Participants

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