

HOMELAND SECURITY ADVISORY COUNCIL



COMMUNITY RESILIENCE TASK FORCE RECOMMENDATIONS

JUNE 2011

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Homeland Security Advisory Council

Community Resilience Task Force

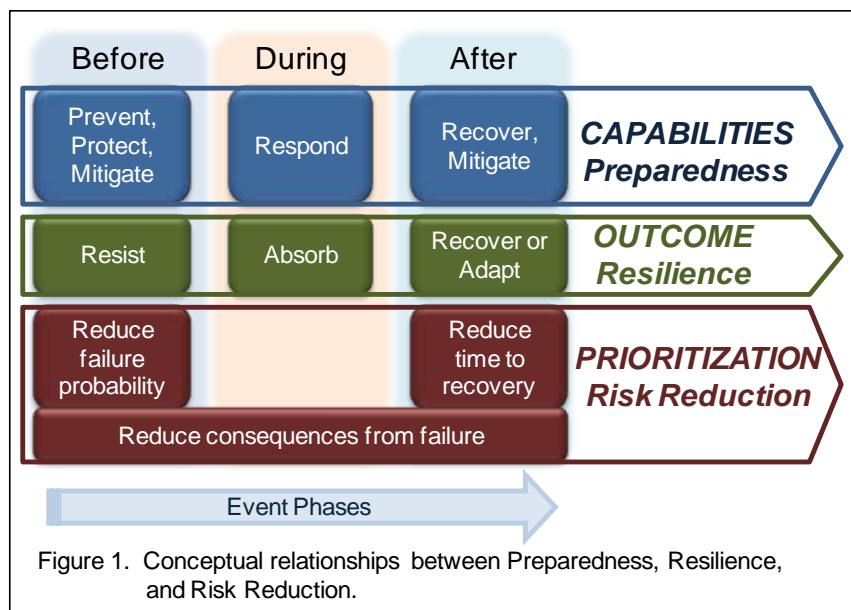
Executive Summary

Resilience was identified in the 2010 Quadrennial Homeland Security Review (QHSR) Report as one of three foundational elements essential to a comprehensive approach to homeland security; the report also defines Ensuring Resilience to Disasters as one of five missions of the Department. Members of the Community Resilience Task Force (CRTF) view those actions as a prescient prelude to the emerging national resilience imperative. The recent Presidential Policy Directive on National Preparedness (PPD-8) tasks the Secretary of Homeland Security to lead the charge in enhancing national resilience while also making clear the complex nature of this responsibility, which is shared with diverse stakeholders across the homeland security enterprise.

The Department of Homeland Security (DHS) clearly has an important role to play in building national resilience, but at its core, the resilience charge is about enabling and mobilizing American communities. The CRTF acknowledges that many relevant activities are already underway, particularly in fostering development of preparedness capabilities, but observes that those activities are rarely linked explicitly to resilience. Thus, the Task Force identified an urgent need for clear articulation of the relationships and dependencies between resilience and other homeland security efforts—particularly preparedness and risk reduction. Clarification of these relationships is crucial both to build shared understanding across diverse stakeholder communities and to motivate action throughout the Nation. A more integrated approach also offers opportunities to identify and leverage synergies across programs, enabling conservation of scarce resources.

The CRTF offers the conceptual framework shown in Figure 1 as a starting point for describing the relationships between *resilience*, *preparedness*, and *risk reduction*. The findings and recommendations provided in this report will be most effective if they build from a coherent view of these interdependent relationships.

The CRTF identified two key facets to national resilience and therefore formed sub-panels to consider separately



resilience stemming from people, their individual and collective actions, and resilience of the built environment that delivers essential services to the communities and regions in which people live. Primary recommendations are provided below.

Recommendations that apply across the full range of Community Resilience activities include:

Recommendation 1.1: *Build a Shared Understanding of the Shared Responsibility.* DHS should take the lead in working with key stakeholder groups to develop and share models for resilience—illustrations of resilience in operational settings—within the context of each group. The purpose is to motivate stakeholders to learn from each other and to do what they can to enhance resilience without waiting for external intervention.

Recommendation 1.2: *Build a Coherent and Synergistic Campaign to Strengthen and Sustain National Resilience.* DHS should align policies, programs, and investments to motivate and operationalize resilience, and should use its leadership charge from PPD-8 to motivate similar actions across the federal government and throughout the Nation.

Recommendations 1.3: *Organize for Effective Execution.* DHS should establish a National Resilience Office and charge it with building the resilience foundation envisioned by the QHSR.

Recommendation 1.4: *Build the Knowledge and Talent Base for Resilience.* DHS should implement a research program to build the intellectual underpinnings for resilience training and education programs to be delivered throughout the Nation.

Recommendations related to enhancing individual and societal resilience include:

Recommendation 2.1: *Update ready.gov.* DHS should establish and execute a plan for periodic review and refresh of the content and presentation of information on ready.gov; messages should be linked explicitly to resilience outcomes.

Recommendation 2.2: *Build Public Awareness.* DHS should develop and implement a comprehensive and coherent suite of communications strategies in support of a national campaign to increase public awareness and motivate individual citizens to build societal resilience.

Recommendation 2.3: *Motivate and Enable Action.* DHS should adapt and implement proven incentive and award programs to motivate individual and community engagement and action, and further develop mechanisms to facilitate and enable engagement.

Recommendations targeting urban planning for the built environment include:

Recommendation 3.1: *Leverage Existing Federal Assets.* DHS, in conjunction with the General Services Administration and local officials, should develop a Resilient Community Initiative (RCI) that leverages federal assets and programs to enable community resilience.

Recommendation 3.2: *Align Federal Grant Programs to Promote and Enable Resilience Initiatives.* DHS should review and align all grant programs related to infrastructure or capacity building, and should support development of synchronized strategic master plans for improvement of operational resilience throughout the Nation.

Recommendation 3.3: *Enable Community-Based Resilient Infrastructure Initiatives.*

DHS should transform its critical infrastructure planning approach to more effectively enable and facilitate communities in their efforts to build and sustain resilient critical infrastructures.

Recommendation 3.4: *Enable Community-Based Resilience Assessment.*

DHS should coordinate development of a community-based, all-hazards American Resilience Assessment (ARA) methodology and toolkit.

Related findings, together with a more complete elaboration of each recommendation, are provided in sections 1-3. Also included are brief vignettes to illustrate key points of discussion. Appendices include a list of relevant references from published literature that may be helpful in development of follow-on efforts, as well as a more complete explanation for selected vignettes.

The CRTF believes the time is right for DHS to embrace the PPD-8 mandate, coupling resilience explicitly into development of the National Preparedness Goal by using the sub-elements of resilience to describe target levels of preparedness in terms of desired *outcomes* in addition to *outputs* (capabilities).

Introduction

The terrorist attacks of 11 September 2001, major infrastructure failures like the Northeast Blackout of 2003, natural disasters including Hurricane Katrina in 2005, catastrophic accidents such as the Gulf of Mexico Deepwater Horizon Oil Spill in 2010, and the spate of severe weather events in the spring of 2011 vividly demonstrate that America must cope with a diverse spectrum of adverse events. In the wake of such incidents we must be equipped to mitigate immediate and cascading effects and sustain, or rapidly restore, essential community infrastructures and business capacities—doing so with minimum individual, societal, and economic consequences. But such resilience does not occur without strategy—embodied in operational plans, supported by targeted investment, and tested for effectiveness—together with appropriate mechanisms to motivate and assess progress.

A growing number of government documents highlight the resilience imperative. The National Security Strategy¹ notes that “*national security draws on the strength and **resilience** of our citizens, communities, and economy...It must also include a commitment to building a more secure and **resilient** nation...*” The QHSR Report² identifies **resilience** as one of three foundational elements essential to a comprehensive approach to homeland security, describing the need to “*foster individual, community, and system robustness, adaptability, and capacity for rapid recovery.*” It further identifies “*Ensuring **Resilience** to Disasters*” as one of five DHS missions.

Ensuring Resilience to Disasters

*Despite ongoing vigilance and efforts to protect this country and its citizens, major accidents and disasters, as well as deliberate attacks, will occur. The challenge is to build the capacity of American society to be **resilient** in the face of disruptions, disasters, and other crises.*

QHSR Report

More recently, the Presidential Policy Directive on National Preparedness (PPD-8)³ released on March 30, 2011 is “*aimed at strengthening the security and **resilience** of the United States through systematic preparation for the threats that pose the greatest risk to the security of the Nation, including acts of terrorism, cyber attacks, pandemics, and catastrophic natural disasters.*” While PPD-8 is intended to “*galvanize action by the Federal Government,*” it also acknowledges the “*shared responsibility of all levels of government, the private and nonprofit sectors, and individual citizens.*” PPD-8 tasks the Secretary of Homeland Security to “*coordinate a comprehensive campaign to build and sustain national preparedness, including public outreach and community-based and private-sector programs to enhance **national resilience**, the provision of Federal financial assistance, preparedness efforts by the Federal Government, and national research and development efforts.*”

And the International Strategy for Cyberspace⁴ published in May 2011 identifies as a key policy priority: “*Protecting Our Networks: Enhancing Security, Reliability, and **Resiliency.***”

¹ The White House (2010). “National Security Strategy.” p. 10. www.whitehouse.gov.

² Department of Homeland Security (2010). “Quadrennial Homeland Security Review Report: A Strategic Framework for a Secure Homeland,” p. ix. www.dhs.gov.

³ The White House (2011). “Presidential Policy Directive/PPD-8: National Preparedness.” www.whitehouse.gov.

⁴ The White House (2011). “International Strategy for Cyberspace: Prosperity, Security, and Openness in a Networked World,” P. 18. www.whitehouse.gov.

The federal government plays a vital role in building and sustaining national resilience, as is indicated by the growing strategic emphasis noted above. But this is an immense task that involves stakeholders throughout every sector of the Nation—public and private. PPD-8 calls for DHS leadership as it coordinates a ‘*comprehensive campaign*’ in cooperation and collaboration with other stakeholders as is implied by the ‘*shared responsibility*’ clause of the directive. Both top-down and bottom-up strategies are needed to achieve the envisioned whole-of-Nation resilience; but at its core, the resilience charge is about enabling and mobilizing American communities.

Global history includes examples of what were termed *resilient societies*. The British *stiff upper lip* throughout World War II and, more recently, the resolve British citizens showed after the July 2005 bombings, evidenced by resuming train service the following day, are often cited as exemplars. Israel’s ability to motivate public vigilance and foster individual preparedness underpin its *societal resilience* in the face of ongoing terrorist attacks. Some argue that the U.S. was resilient in the aftermath of 9/11, although the economic and societal toll extracted from our Nation went well beyond the ‘ground zero’ destruction. Recent press cites a number of examples of Japan’s resilience in the aftermath of the March 2011 earthquake and tsunami.⁵ And news coverage of the floods and tornados plaguing the Nation in 2011 often spotlights examples of individual resilience amidst widespread destruction.

The question then becomes: How can we build a *more resilient nation*—one that *proactively adapts to change and rapidly recovers from disruption* when things do not go as anticipated? Moreover, how can we ensure that our citizens, the communities in which they live, and the organizations and businesses that deliver essential goods and services—all of which are vital to a functioning society—are resilient?

The Homeland Security Advisory Council’s (HSAC) Community Resilience Task Force (CRTF) was established to provide Secretary Napolitano with recommendations to enable the Department to establish and implement community-based resilience policies, programs and practices throughout the Nation. Key points from the Secretary’s tasking to the HSAC are summarized below:

- How can we increase individual and community engagement and participation in resilience capacity building and sustainment?
- How should we build, design, and incorporate security and resilience into urban planning?
- How can we better plan and resource acquisition across the federal government in support of national, regional, state, tribal, local, and individual resilience efforts?

The full charge to the CRTF is provided in Appendix A.

To those ends, from December 2010 to June 2011, the CRTF conducted a series of conference calls, meetings, and deliberations, engaging national Subject Matter Experts to address this

⁵See, for example:

“On Northeast Coast, Portraits of Japanese Resilience,” www.npr.org, 26 April 2011;

“From past tragedies comes Japan’s legacy of resilience,” Kelly Kennedy, USA TODAY, 14 March 2011;

“Japan’s Resilience,” Steve McCann, American Thinker, 26 April 2011.

foundational homeland security challenge. Led by Chairman Governor Martin O'Malley and Vice Chairs Dr. Ruth David and Mr. Jeff Moss, the CRTF developed a series of findings and recommendations described in this report. CRTF Membership is provided in Appendix B and a list of the Subject Matter Experts who briefed the Task Force is provided in Appendix C.

In many of the examples referenced above, resilience stemmed from individual / cultural / societal behaviors that served to mitigate the effects of disruption / destruction of the 'built environment'⁶. This suggests there are two key facets to national resilience. The CRTF therefore formed two sub-panels to consider separately resilience stemming from people, their individual and collective actions, and resilience of the built environment that delivers essential services to the communities and regions in which people live.

The report begins with a discussion of resilience in the context of homeland security to provide a backdrop to the CRTF's recommendations. Over-arching findings and recommendations are provided in section 1; findings and recommendations specific to each of the two sub-panels are provided in sections 2 and 3.

Resilience in Context: *Homeland Security*

Resilience is a time-tested goal; its origins date back to the 1620s when it was used to convey "to rebound, recoil."⁷ A rich history of research and application of the term within domains ranging from ecological sustainability to societal and infrastructure resilience exists in the literature; a sampling of relevant publications is provided in Appendix D. Resilience entered the homeland security lexicon more recently⁸, but much of the prior research, particularly work conducted in the past two decades, is directly applicable to this mission.

Resilience in homeland security mission context is defined in the DHS Risk Lexicon as shown in the box at right. The QHSR Report identified resilience as a foundational element for homeland security but did not explicitly connect the term to other aspects of the mission.

CRTF members see resilience as a goal—a *desired outcome*—that is relevant across a broad spectrum of homeland security strategies—from prevention to recovery, including preparedness. The resilience sub-factors (resist, absorb, recover, adapt) define

Resilience

Definition: ability to resist, absorb, recover from or successfully adapt to adversity or a change in conditions.

Extended Definition:

- 1) *Ability of systems, infrastructures, government, business and citizenry to resist, absorb, recover from, or adapt to an adverse occurrence that may cause harm, destruction, or loss of national significance*
- 2) *Capacity of an organization to recognize threats and hazards and make adjustments that will improve future protection efforts and risk reduction measures*

DHS Risk Lexicon, September 2008
www.dhs.gov/xlibrary/assets/dhs_risk_lexicon.pdf

⁶ "The term 'built environment' refers to the human-made surroundings that provide the setting for human activity, ranging in scale from personal shelter and buildings to neighborhoods and cities that can often include their supporting infrastructure, such as water supply or energy networks." Source: Wikipedia.

⁷ Dictionary.com, "resilience," in *Online Etymology Dictionary*. Source location: Douglas Harper, Historian. <http://dictionary.reference.com/browse/resilience>. <http://dictionary.reference.com>. Accessed: May 24, 2011.

⁸ Resilience formally entered the Homeland Security lexicon in January 2006 with the public announcement of the recommendations contained in the Homeland Security Advisory Council's Critical Infrastructure Task Force Report, which can be found at http://www.dhs.gov/xlibrary/assets/HSAC_CITF_Report_v2.pdf. Accessed June 1, 2011.

subordinate objectives that contribute to the overall degree of resilience and provide useful targets for measures implemented to enhance resilience. The Critical Infrastructure Task Force Report⁹ noted that “*strategies based on resilience address all three components of the risk equation in an integrated fashion.*” **Thus, resilience provides a unifying goal for a risk-based framework within which individual strategies and activities can be more effectively described and prioritized.** The task force believes this view is consistent with DHS’s definition of resilience (as cited above) and adds value by describing relationships between resilience and other homeland security strategies.

The QHSR Report notes that “*for the past 7 years, homeland security has rested on four key activities—prevention, protection, response, and recovery.*”¹⁰ PPD-8, in defining National Preparedness, extends this construct to include *mitigation* as shown in the box below. These activities can be mapped to three phases in time—before, during, and after an adverse event (phase boundaries may be blurred by the nature of an event). Activities before an event emphasize prevention, protection, and mitigation; as an event unfolds attention turns to response; and post-event activities focus on recovery as well as mitigation of impacts from future events.

National Preparedness addresses the continuum of event phases, providing a comprehensive approach to building and sustaining the capabilities required for each activity. It necessarily emphasizes actions to be taken ‘*before*’ an adverse event even when the benefits may not be realized until the ‘*during*’ or ‘*after*’ phases. Priorities focus on capabilities needed to address “*those threats that pose the greatest risk to the security of the Nation.*”

“National Preparedness” refers to the actions taken to plan, organize, equip, train, and exercise to build and sustain the capabilities necessary to prevent, protect against, mitigate the effects of, respond to, and recover from those threats that pose the greatest risk to the security of the Nation.

“Prevention” refers to those capabilities necessary to avoid, prevent, or stop a threatened or actual act of terrorism.

“Protection” refers to those capabilities necessary to secure the homeland against acts of terrorism and manmade or natural disasters.

“Mitigation” refers to those capabilities necessary to reduce loss of life and property by lessening the impact of disasters.

“Response” refers to those capabilities necessary to save lives, protect property and the environment, and meet basic human needs after an incident has occurred.

“Recovery” refers to those capabilities necessary to assist communities affected by an incident to recover effectively.

PPD-8: National Preparedness, Definitions

The relationships between resilience, preparedness, and risk described above were inferred from individual documents as cited. The CRTF believes there is value in development of a conceptual framework that more clearly describes these relationships and offers the discussion that follows as a starting point.

Synthesis of the key concepts described above yields a more holistic framework that enables clearer articulation of the ‘what’ (capabilities) and ‘why’ (outcomes) of preparedness within a risk-based decision framework (prioritization). Concatenation of the underlying principles yields: *National Preparedness* refers to actions taken to build and sustain *capabilities* that reduce *risk*

⁹ Ibid. p. 5. [In the report, the three components of risk are defined as threat, vulnerability, and consequence.]

¹⁰ Department of Homeland Security (2010). “Quadrennial Homeland Security Review Report: A Strategic Framework for a Secure Homeland,” p. 14. www.dhs.gov.

and enable activities (*prevent, protect, mitigate, respond, recover*) to enhance *resilience* (ability to *resist, absorb, and recover or adapt*).

It was observed earlier that preparedness *activities* can be mapped to three phases—before, during, and after an adverse event; this mapping illustrates the employment of preparedness *capabilities*. The sub-factors of resilience defined in the DHS Risk Lexicon—*resist, absorb, and recover or adapt*—can be mapped onto the same three phases and used to describe subordinate objectives (*outcomes*) against which preparedness capabilities (*outputs*) could be measured. Thus, capabilities developed to prevent, protect, and mitigate strengthen our ability to resist hazards; response capabilities enable us to absorb impacts; and recovery capabilities support a return to normalcy—or adaptation to a new norm which may mitigate future impacts. Research on economic resilience offers a related set of risk-based outcomes that also suggest useful measures: *reduced failure probability, reduced consequences from failure, and reduced time to recovery*¹¹. These outcomes are analogous to the more general resilience outcomes and also can be mapped to the three event phases.

Figure 1 illustrates these conceptual relationships between **preparedness**, which delivers capabilities that enable activities; **resilience**, which defines the outcomes produced by those capabilities; and **risk reduction**, which supports prioritization of capability development.

Provided below is a brief description of how this framework could be used to help key stakeholders better understand their roles in enhancing national resilience.

The discussion is not meant to be comprehensive, but rather to illustrate a conceptual approach to integration of activities relating to preparedness, resilience, and risk management.

Before Activities emphasize prevention of the threat, protection of potential targets (which may range from significant national assets to local schools or individual homes depending on the stakeholder perspective), and mitigation “to reduce loss of life and property by lessening the impact of disasters.”¹² The objective is to strengthen the capacity to ‘resist,’ through strategies to thwart intentional attacks or other man-made disasters; through protective measures that reduce the probability of failure, like access controls

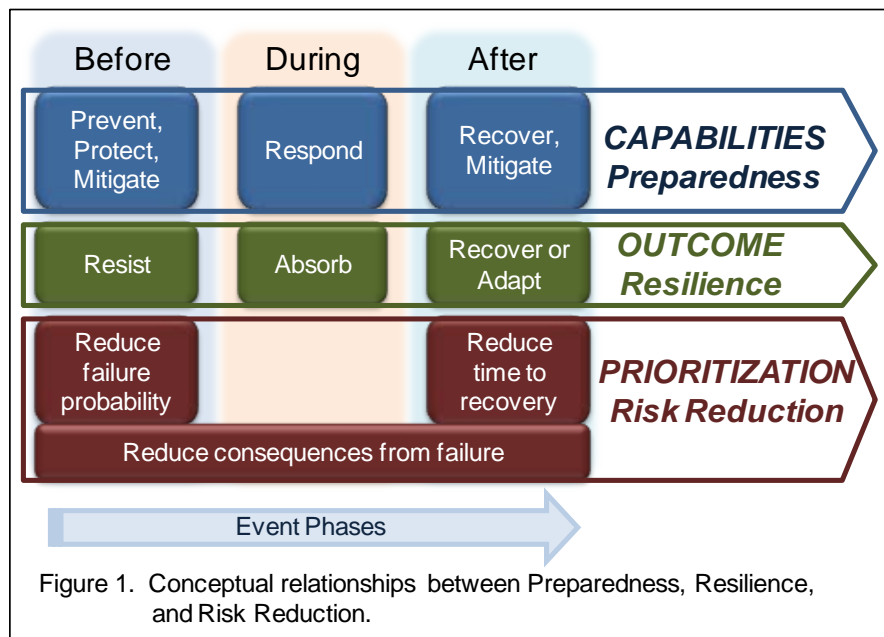


Figure 1. Conceptual relationships between Preparedness, Resilience, and Risk Reduction.

¹¹ Rose, Adam (2004). “Defining and Measuring Economic Resilience to Disasters.” Disaster Prevention and Management: Volume 13, Number 4, pp. 307-314. © Emerald Group Publishing Limited. ISSN 0965-3562.

¹² See PPD-8 definition of Mitigation.

or protective barriers; and by taking steps to reduce the consequences of failure, through measures such as provision of back-up power or ensuring that critical facilities are not located in areas known to be vulnerable to adverse events. Design of protection and mitigation measures, in particular, is typically based on assumptions about the level of ‘resistance’ needed (e.g., levies that protect against the ‘100-year flood’), but in all practical applications there remains a residual risk. Thus, the objective is to implement preventive, protective, and/or mitigation capabilities that provide sufficient ‘resistance’ to reduce that residual risk to an acceptable level.

During

Activities emphasize response “to save lives, protect property and the environment, and meet basic human needs after an incident has occurred.”¹³

The objective is to build and sustain capabilities that enable the Nation (or community, or business, or individual) to ‘absorb’ impacts from an adverse event without experiencing serious disruption. Assumptions regarding the magnitude of the event are crucial in defining preparedness capabilities for response. For example, planners might specify hospital capacity to absorb a baseline number of casualties but augment that capacity with more flexible arrangements to enable a community to better absorb a larger disaster. Preparedness efforts relating to response can be calibrated by specifying desired outcomes in terms of absorption capacity required to reduce potential consequences to an acceptable level from a risk management perspective.

After

Activities emphasize recovery and/or mitigation of future events, and time becomes an important indicator of success. But to make time a useful measure, it must be viewed in the context of what constitutes recovery from an

objective perspective. In the case of critical infrastructure disruptions, recovery may be viewed in terms of service levels (e.g., restoration of power to vital facilities like hospitals within a very short window of time; power to all homes within a longer window). If a building is destroyed, recovery may be viewed either in terms of the time required to relocate and re-establish the functionality previously housed there or the time required to rebuild the building. If an entire community is destroyed, then recovery often becomes adaptation to a new norm, which may include mitigation measures that reduce future risks (e.g., by not rebuilding in flood zones). Post-event mitigation activities may stem from lessons-learned from that event or from opportunities afforded by the need to rebuild (or both); in either case, such activities serve to enhance resilience against future adverse events (and therefore are analogous to mitigation activities in the ‘before’ phase).

The CRTF observes that an opportunity exists to adopt such a conceptual approach in development of the National Preparedness Goal mandated by PPD-8—using the sub-elements of resilience to describe target levels of preparedness in terms of desired *outcomes* in addition to *outputs* (capabilities). As defined in PPD-8, “National Preparedness refers to the actions taken....” In the eyes of the CRTF, those actions will directly impact National Resilience.

¹³ See PPD-8 definition of Response.

1.0 Over-Archiving Findings and Recommendations

The CRTF identified four top-level findings and recommendations that must be addressed to strengthen individual and societal resilience together with that of the built environment. The recommendations that follow stem from the fact that resilience is not well understood by key homeland security stakeholders; it therefore has not been treated as an integral element of plans and programs to date. In addition, the intellectual underpinnings needed to build resilience into a true foundational element for homeland security are not yet mature.

Finding 1.1: Resilience is not yet commonly understood by the diverse stakeholder groups upon whom progress depends; although PPD-8 calls for shared responsibility across all levels of government, the private and nonprofit sectors, and individual citizens, their respective roles and responsibilities remain unclear.

The CRTF believes that ‘resilience’ is seen as jargon in that it too often is used imprecisely. References to resilience are increasingly heard from White House and other federal officials, but the descriptions of what is meant remain both varied and abstract. Regionally-focused resilience initiatives are gaining momentum, yet a common understanding and standard measures that would enable assessment of the current state of resilience have not emerged.

Of particular concern is a perception that resilience relates only to recovery in the aftermath of a disaster and therefore need not be considered when planning for preventive, protective, mitigation, and response capabilities. The recently released PPD-8 on National Preparedness describes resilience as “*the ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies,*” which implies that resilience is not separable from protection, mitigation, and response, and therefore must be central to preparedness planning, but PPD-8 does not describe those relationships. The CRTF believes that resilience is indeed a foundational concept for homeland security and proposed in the previous section a conceptual framework that links the various homeland security activities to resilience outcomes. Further, task force members believe:

- ◆ Resilience has deterrent value—making systems/assets/communities resilient makes them less attractive targets; it therefore is integral to prevention.
- ◆ Resilience has protective value—it improves communities’ abilities to resist blows stemming from disruption of infrastructure or other community services.
- ◆ Resilience planning enables communities to more effectively respond and recover from natural and manmade disasters—to absorb impacts and adapt to altered conditions. True resilience requires changes in culture; stakeholders at all levels must ask and answer the hard questions, such as “what would we do if outside assistance was delayed?”
- ◆ Resilience must be ‘front-loaded’ into preparedness efforts, not seen as an after-thought following an event, when efforts to enhance resilience may be hampered by association with failure. CRTF members are concerned that resilience may be unpopular among some public safety officials due to the implication that the need is driven by anticipation of failure, but the reality is that a manmade or natural disaster will eventually occur. It is myopic not to consider ‘the day after’ in preparedness planning.

In short, the CRTF believes that the high level definition of resilience provided in government documents is necessary but insufficient in that it does not describe resilience through the eyes of the homeland security stakeholders.

Recommendation 1.1: *Build a Shared Understanding of the Shared*

Responsibility. DHS should take the lead in working with key stakeholder groups to develop and share models for resilience—illustrations of resilience in operational settings—within the context of each group. The purpose is to motivate stakeholders to learn from each other and to do what they can to enhance resilience without waiting for external intervention.

There is no one-size-fits-all approach to building and sustaining national resilience. The priorities of local governments are different from those of small business owners even in the face of a common threat. Geographically distributed corporations with a presence in communities throughout the nation have a still different set of priorities, as do the operators of our Nation’s critical infrastructures. And all of these stakeholder groups are dependent—to varying degrees—on the behaviors and actions of individuals, as citizens, employees, and/or customers.

While every stakeholder group is itself diverse, the CRTF believes there is value in identifying the common ground for shared objectives in terms of stakeholder-specific models that illustrate what constitutes resilience within the operational context of particular groups. Such models could build a shared understanding while also facilitating development of common measures of resilience. Significant opportunities exist to learn from the experience of other nations as well as from local, regional, and private sector resilience initiatives already underway.

The BART vignette in the box at right provides one example of lessons-learned in the aftermath of a disaster that was translated into a more robust response capability to mitigate future impacts, and ultimately into better daily service for customers; in this case, the mitigation measures yielded benefits well beyond preparedness for a future adverse event. Sharing of such exemplars with other localities as they develop their own evacuation plans could help foster community resilience while also building an awareness of peripheral benefits that might accrue from preparedness investments.

DHS should engage existing associations and organizations (e.g., Chamber of Commerce, Boy Scouts of America, Girl Scouts of America, Veteran Service organizations, faith-based organizations,

San Francisco Bay Area Rapid Transit (BART)

The attacks of 9/11/01 occurred just as the morning rush service in the Bay Area was ending. As news was received, workers understandably were anxious to leave the downtown work centers and return home. BART had to immediately reconfigure transit service and provide a reverse commute period.

After this experience the transit agency created a notification system reaching all major employers in the cities’ business centers that allows immediate communication of the service plan, informs customers what service is available when, and better manages the crush loads of people rushing to stations during emergencies. This capability helps reduce the attendant risks of station overcrowding and creating another target of opportunity or otherwise unsafe conditions for the public.

Taking this communications objective a bit farther and providing direct communication with customers wanting to use BART, the agency developed several social media communications strategies. Using both Twitter and Facebook, customers can opt in to receive notifications of major service changes, disruptions or other current information about service schedules and on-time performance.

and other associations with direct reach into various communities) in a collaborative effort to develop these stakeholder-specific resilience models. Many such groups have both a local presence throughout the nation as well as a national organization that could be enlisted to help synthesize shared objectives in support of national resilience initiatives.

Non-Governmental Organizations (NGOs) constitute a unique stakeholder group in that they sometimes are the most knowledgeable, efficient, operationally-experienced, locally-based, and trusted “go-to” entities for disaster response and recovery. But, as with any community-based activity, NGO capabilities and capacities are at risk and must be made operationally resilient. Collaborative initiatives in partnership with NGOs may provide valuable opportunities to explore, test and evaluate, and learn from prototype resilience initiatives—developing models for resilience with broad applicability. Appendix E provides more specific recommendations.

The stakeholder-specific models of resilience should be consistent with the umbrella definition articulated in the National Security Strategy and PPD-8—*providing a **shared understanding of the shared responsibility for national resilience***—but should provide sufficient fidelity to enable assessment/measurement and motivate progress toward enhancing national resilience. Once developed, DHS should ensure that these models are shared through targeted awareness/educational campaigns to foster action throughout the Nation and should subsequently examine the efficacy of such campaigns; once again, key stakeholder groups should be enlisted to help promulgate the message.

Efforts described above will further mature our collective understanding of resilience as it relates to other homeland security plans and programs. In parallel with this process, actions are needed to more effectively enable and motivate stakeholders to execute their shared responsibilities for building national resilience.

Finding 1.2: The enhancement and sustainment of national resilience is not yet uniformly motivated by DHS via policies, programs, or investment.

Numerous studies¹⁴ have been conducted—by governmental, non-governmental, and private sector organizations—and resilience standards have been suggested. Yet there are no policies, national objectives, or promulgation of the specific means required to actually assess, achieve, or sustain resilience. PPD-8 directs the Secretary of

Homeland Security to develop a national preparedness goal that is “informed by the risk of specific threats and vulnerabilities” but makes no mention of national resilience as an outcome.

The federal government is the largest single customer and funder of homeland and national security related capabilities. A majority of current DHS grants go toward static preventive/protective measures. While a necessary beginning, new grants must empower states and local governments to build and sustain certifiably resilient communities—and by extension—a more resilient America. Anecdotal feedback to the CRTF indicates that some legacy grant programs may actually be working at cross-purposes—impeding rather than enabling progress toward national resilience. The Red River Valley vignette provided below illustrates this concern. A more complete description of this issue is provided in Appendix E.

¹⁴ See Appendix D for selected references.

In 2010, DHS incorporated resilience engineering considerations for planners in the amendments to the DHS Acquisition Planning Guide. These amendments, which became mandatory on 1 October 2010, demonstrate that the Department is committed to adopting the goal of resilience in its management of the DHS enterprise. The inclusion of resilience issues in procurement planning across the federal government inter-agency community provides an opportunity to make more efficient use of resources, better serve the public, and exemplify DHS leadership in building national resilience.

FEMA’s initiative to incorporate a “Whole Community Philosophy” into preparedness planning for catastrophic events is another commendable example of an effort to build community resilience, yet that aspect of the initiative is not emphasized.

The CRTF observed that a number of initiatives already underway will, over time, enhance community resilience, but additional work is needed. In particular, most relevant activities make little (if any) mention of their contribution to building resilience.

Red River Valley Floods

Current FEMA policy does not allow for flood mitigation structures to be constructed on property acquired under the hazard mitigation grant program. In areas of frequent flooding, FEMA’s policy results in funding being used repeatedly to construct temporary levees. In North Dakota alone, temporary levees have been constructed year after year, only to be removed at the end of flooding season, incurring significant costs for FEMA and local communities.

Whole Community

To ensure that our efforts become part of an interconnected plan of action, we are focused on our “Whole Community” initiative. . .

As the name of the initiative indicates, it is truly the whole community that must be prepared to respond in ways that extend beyond the normal paradigms in which we have traditionally operated.

*Testimony of Administrator Craig Fugate, FEMA
U.S. House Transportation and Infrastructure
Committee
Subcommittee on Economic Development,
Public Buildings, and Emergency Management
March 31, 2011*

Recommendation 1.2: *Build a Coherent and Synergistic Campaign to Strengthen and Sustain National Resilience.* DHS should align policies, programs, and investments to motivate and operationalize resilience, and should use its leadership charge from PPD-8 to motivate similar actions across the federal government and throughout the Nation.

Using the stakeholder-specific models described in Recommendation 1.1, DHS should foster identification of specific resilience objectives for key groups to enable integration of their efforts into a national resilience framework and strategy. The objectives must be action-oriented and accompanied by clear measures of effectiveness that could feed a ‘resilience dashboard’ at the national level to help motivate progress and thwart complacency. Development of a common lexicon—i.e. a shared understanding—is vital to this recommendation. Stakeholders at all levels must understand how their individual activities contribute to community and national resilience.

Research relating to resilience measures can be found in the literature. The Software Engineering Institute, for example, is developing a CERT® Resilience Management Model¹⁵ to guide enterprise planning and development. Work conducted at Pennsylvania State University set forth a general resilience framework including performance measures for technical, organizational, social, and economic dimensions,¹⁶ and suggests performance criteria for resilience attributes defined as robustness, redundancy, resourcefulness, and rapidity for each dimension of that framework. DHS's Science and Technology Directorate is currently funding work at the University of California, Irvine intended to develop a quantitative index of psychosocial impacts of disasters and terrorism (including measurement of the population's health, social functioning and public trust) using publicly available statistics, archival and administrative data. These are only three examples from a vast array of literature that could inform development of common objectives and measures to underpin the national resilience campaign. DHS should drive convergence of relevant prior work toward a common framework and lexicon to enable derivation of standard measures of resilience for the homeland security mission.

DHS policies, programs, and investments should then be aligned to drive local progress as evidenced by subordinate measures of performance. Specifically, future Federal Grants should empower state and local resilience efforts; and existing programs should be carefully scrutinized and adjusted as necessary to mitigate unintended consequences stemming from conflicting or stove-piped grant guidelines. Additional specifics regarding alignment of grant programs are provided in Section III.

Further, it is necessary to bring the whole-of-government together to underpin the whole-of-Nation campaign to strengthen and sustain national resilience. DHS should ensure that its own activities are well-integrated, and then should exercise its leadership role in advocating that all federal agencies incorporate resilience considerations into their planning, budgeting, and acquisition processes.

Finding 1.3: DHS activities would benefit from more effective coordination and integration as organizational components work to build the resilience foundation for homeland security.

Resilience-related programs and responsibilities are distributed throughout headquarters and the operational components. As noted above, resilience is not separable from efforts targeting prevention, protection, preparedness, response, or recovery, but those relationships and interdependencies have not been articulated.

Strategies and programs remain disconnected; and potential synergies are not being realized. DHS must lead by example in bringing coherence to national resilience initiatives.

The CRTF applauds the DHS Policy Office for its formation of the Department-wide Resilience Integration Team (RIT), viewing this as a good first step. The RIT has a number of important initiatives in progress and others under development, but the CRTF sees the need for a more

¹⁵ Software Engineering Institute (2010). "CERT® Resilience Management Model, Version 1.0; Process Areas, Generic Goals and Practices, and Glossary. © 2010 Carnegie Mellon University. <http://www.cert.org/resilience/>

¹⁶ Rose, Adam (2004). "Defining and Measuring Economic Resilience to Disasters." *Disaster Prevention and Management*; Volume 13, Number 4, pp. 307-314. © Emerald Group Publishing Limited. ISSN 0965-3562.

comprehensive role in fostering development of the resilience foundation for homeland security and does not believe the RIT has sufficient authority or resources to deliver on this mandate.

Recommendations 1.3: Organize for Effective Execution. DHS should establish a National Resilience Office and charge it with building the resilience foundation envisioned by the QHSR Report.

To successfully engage communities in building resilience requires a clear mandate from the top; the National Resilience Office would serve as a direct conduit to, and representative of, the Secretary of DHS for this homeland security foundational element. The CRTF also sees a need for strategic and policy leadership; the National Resilience Office should be charged with providing leadership, coordination, and integration across a broad array of activities, including:

- ◆ **Planning:** Develop national resilience policies and programs; refine policies and programs based on assessment and analysis (as described below); prioritize funding to implement research-supported policies.
- ◆ **Assessment:** Leverage the results from prior recommendations to develop comprehensive and consistent resilience metrics (e.g., time to restoration, capacity to absorb) to improve shared understanding and sound investment, enabling achievement and sustainment of acceptable levels of all-hazards resilience throughout the Nation. Monitor efforts towards resilience at all levels of government and within communities.
- ◆ **Analysis:** Identify key variables that shape the effectiveness of resilience efforts (e.g., level of understanding and resulting action by the public in achieving resilience indicators). Evaluate how resilience efforts at the infrastructure, business, community, and individual levels could enhance the self-reliance and continuity capacities of these entities and reduce the need for more expensive Federal Government response and recovery efforts. Develop research-informed policy options.
- ◆ **Motivate:** Develop case studies to illustrate the Resilience Return on Investment (RROI) to help communities and businesses understand the advantages of being more resilient, and to educate and inform key decision-makers with regard to policy choices.
- ◆ **Engage:** Directly engage Executive Branch departments and agencies, the Congress, businesses, communities, non-governmental and faith-based organizations, professional associations, and state and local governments throughout the Nation to accelerate national resilience efforts.
- ◆ **Enable:** Create a requirement-based information sharing and intelligence capacity to make clear the need for key stakeholder resilience to specific threats and hazards.

As noted earlier, resilience is a mature concept, but its application to homeland security is relatively new. While important steps, as recommended above, can be taken immediately, additional work is needed to improve the Nation's understanding of resilience in this context.

Academic programs focused on Homeland Security are maturing in teaching institutions throughout the Nation, but an academically rigorous approach to building and sustaining resilience as envisioned in the QHSR Report, the National Security Strategy, and PPD-8 has not yet emerged.

Finding 1.4: The requisite knowledge base needed to make resilience a true foundational element for homeland security does not yet exist.

Sustaining national resilience over the long term requires a far deeper understanding of the underlying principles and characteristics that constitute resilience in highly complex environments. This is an inherently multi-disciplinary topic that requires engagement of diverse communities including physical, social,

and behavioral sciences; engineering; economics and business; policy and public administration; and law and medical practitioners. Additionally, potential synergies exist with emerging research and standards focused on sustainability.

Although a great deal of relevant research is underway throughout the U.S. and abroad, the CRTF was unable to identify a coherent research agenda that would support development of the content needed to underpin an academic program to develop future practitioners.

A research program is needed to advance the state of practice and to build the talent base

Recommendation 1.4: *Build the Knowledge and Talent Base for Resilience.* DHS should implement a research program to build the intellectual underpinnings for resilience training and education programs to be delivered throughout the Nation.

across the Nation. The research program should include a focus on RROI measures to establish the business case for resilience across the diverse stakeholder groups. Significant opportunities exist both to learn from and to advance the practice of enterprise risk management in implementing this program.

DHS also should foster development of awareness, certification, and degree-producing programs for the public, infrastructure operators, businesses, and state and local government officials to further their understanding of the resilience culture and profession.

The CRTF believes these over-arching recommendations are essential to improving public understanding, empowering stakeholder involvement, and increasing return on investment to build community—and by extension—national resilience. Task force members also believe the above discussion is fully consistent with Secretary Napolitano’s frequent statement that *“Homeland security begins with hometown security.”*

The sections that follow provide additional findings and recommendations specific to enhancing the resilience of the population and improving the resilience of the systems and services that support that population.

2.0 Individual and Community Resilience

A key goal of the homeland security mission is to develop resilient communities of responsible, informed, prepared Americans who are able to cope with and adapt in real-time to all-hazards events, *and* who actively engage in strengthening the resilience of their communities—embracing their “shared responsibility” for building and sustaining national resilience. The CRTF believes shortfalls exist throughout the Nation in awareness and understanding of resilience as well as in the motivation of individuals and communities to take action towards this goal. While DHS has a number of relevant activities underway, more effort is needed to bring coherence to the resilience message and to stimulate progress.

“Resilience begins on the level of individuals. A program of resilience would promote self-reliance in the face of unexpected events, encouraging civilians to remain calm when the normal rhythms of life get interrupted. It would also teach individuals to make themselves aware of the risks that may confront them and to be resourceful by learning how to react to crises. And it would make preparedness a civic virtue by instructing civilians to refrain from requesting professional assistance unless absolutely necessary, thus freeing up manpower for those in the greatest need.”

Stephen Flynn
See Appendix D for citation.

It takes time for police, fire, and other emergency responders to arrive on scene when disaster strikes; family members, neighbors, and even strangers are often the first to deliver assistance. Furthermore, the demands on emergency responders are more manageable if there are fewer ‘avoidable victims.’ In the event of a disaster, a resilient public is better equipped to *absorb* the impact and rapidly *recover* or *adapt* to the changed environment. This means that individuals must be prepared to take immediate steps on their own to help mitigate the consequences.

Finding 2.1: The www.ready.gov site is a valuable communications platform, but shortfalls were noted in both content and presentation of information.

FEMA implemented www.ready.gov to deliver information in support of “Ready America. Ready Business. Ready Kids.” The site provides a hub for various stakeholder groups and includes testimonials that illustrate operational preparedness in the business context. But a cursory review of the website, together with feedback from state and local emergency managers, indicates that it does not

effectively promote individual and community resilience, and it does not integrate resilience messages with state and local preparedness programs. In addition, while the website has good general information for preschool and early elementary school children, it does not include interactive information for middle and high school students as would be necessary to build a culture of resilience among all Americans.

CRTF members are also concerned that some information on the ready.gov website is inaccurate or does not reflect current scientific standards. Moreover, the disclaimer that appears on the ready.gov website may discourage the public from relying on its messages (“We are not responsible if information that we make available on this site is not accurate, complete or

current...We reserve the right to modify the contents of the site at any time, but we have no obligation to update any information on this site.”)¹⁷

Finally, Task Force members feel that the website has a somewhat sterile/bureaucratic presentation that does not grab the attention of the targeted users. In today’s social network / technology-savvy society, the website would benefit from utilization of other tools to provide valuable information in creative and stimulating ways in order to more effectively promote resilience / preparedness.

Recommendation 2.1: Update ready.gov.

DHS should establish and execute a plan for periodic review and refresh of the content and presentation of information on ready.gov; messages should be linked explicitly to resilience outcomes.

Ready.gov provides a useful array of information to its targeted audiences, but it is time for a refresh. CRTF members encourage a careful review of content to ensure that all guidance reflects the latest scientific information and recommend that the content be reviewed and updated regularly.

Messages should be expanded to include both the ‘what’ and the ‘why’—making clear the connection of preparedness to resilience. Task Force members further recommend major enhancements to include links to state and territory websites, expansion of the case studies and testimonials to include other stakeholder examples, and additional collaborative features to help build a shared understanding of resilience. The site also should be adapted to more effectively leverage social media technology. The upgraded website should be explicitly tied to the national campaign called for in PPD-8 to foster individual and community resilience, which must rest on a foundation of national imperative, unity, and shared responsibility—emphasizing federal leadership rather than control.

While a more robust ready.gov website will deliver substantial benefits, CRTF members note that not all Americans have Internet access. Thus, a more robust array of communications strategies is needed, as are measures to assess the effectiveness of those strategies.

Finding 2.2: Implementation of the PPD-8 mandate to improve societal resilience against acts of terrorism and natural disasters will require raising the level of public awareness to motivate individuals to assume personal responsibility for preparedness.

DHS has, from its inception, endeavored to raise public awareness and motivate individuals to take basic steps (e.g., stockpiling food and medicines, creating emergency plans and kits) prior to an adverse event. Preparedness efforts are rooted in the belief that such actions will reduce casualties, amplify the effectiveness of existing emergency response capacities, and reduce the overall impact of a disaster. Related

information and communications mechanisms (such as www.ready.gov) continue to mature, but the CRTF believes more work is needed in development and communication of clear, action-oriented messages as well as in identification and implementation of new ways to motivate individuals to assume personal responsibility.

¹⁷ See <http://www.ready.gov/america/other/notices.html>).

Recommendation 2.2: Build Public Awareness. DHS should develop and implement a comprehensive and coherent suite of communications strategies in support of a national campaign to increase public awareness and motivate individual citizens to help build societal resilience.

Failure to communicate effectively can undermine trust between citizens and authorities. Risk communications must reflect the best science of that process and assess the effects of citizen understanding on societal resilience.

Effective communication requires (a) analyzing the risks in order to identify the most critical information; (b) conveying the information

comprehensibly to diverse audiences; and (c) providing the resources needed to act on that understanding. Communications that are unclear to the intended audience or do not address its informational needs may not only fail to help, but also may make matters worse by increasing fear or fostering complacency.

No single message or delivery mechanism works for all audiences. DHS should conduct a complete evaluation of the effectiveness of relevant communications programs currently in place across DHS and refine as needed. Evaluation of communications effectiveness necessitates a review of measures to determine what works and what should be refined (or abandoned). Underlying this recommendation is the need to assess and learn from related communications efforts at home and abroad. Every disaster provides an opportunity to learn, as noted in the vignette at right.¹⁸

Central to this recommendation is the need for actionable messages—individuals must know what they should do. If the message targets preparedness, which requires ongoing vigilance, it must be refreshed periodically and associated with ‘triggers’ to stimulate action (e.g., check your smoke alarm batteries every daylight savings time transition, see a dentist every six months) to remind people to create and maintain their ‘ready kits’ or ‘go packs.’

‘Tsunami Warning, Preparedness, and Interagency Cooperation: Lessons Learned’

*“Another noted phenomenon was that the Hispanic community self-evacuated almost to a person. How they received the information is unclear, but no Hispanic children were in school the day after the event, and employers reported very few Hispanic workers came to work the day of the event. **What network they have informally established is unclear, but we are looking into it as something we may emulate.**”*

Committee on Oversight and Government Reform
Statement of Record; April 14, 2011
Brigadier General Mike Caldwell, Interim Director
Emergency Management Agency, State of Oregon

The CRTF also believes that a robust television, print, and social media advertising campaign is needed to promote the message of individual empowerment and self-reliance, as well as infrastructure, business, community, and national resilience. Members suggest the exploration of novel opportunities to promulgate this campaign, particularly on broadcast and cable television. Television shows and movies have long been used to foster new behavioral

Novel Ways to Promote Resilience

Content producers of various shows could embed the resilience message in the body of their shows, reaching the specific demographic of their audience. For instance, “Modern Family” or “The Simpsons” could feature one member of the family trying to convince another family member to be prepared. A younger demographic could be reached through any of the Nickelodeon or Disney series.

¹⁸ Full text of testimony is provided in Appendix G.

norms (e.g., by depicting characters not smoking and always putting on their safety belt before getting into a car chase); certain resilience behaviors could be similarly modeled.

Additionally, Public Service Announcements (PSAs) featuring actors from the respective shows could be produced and aired to promote the national campaign. PSAs tailored to the specific (and changing) resilience needs of specific communities should identify shared interests and help build trust at all levels of community life. DHS should work collaboratively with content creators and network executives to promulgate key messages.

A parallel effort within schools must be initiated to inculcate a renewed sense and mindset of personal responsibility. DHS should foster development of community-based resilience outreach and education initiatives by supporting school programs that invite firefighters, police officers, and other key individuals from local neighborhoods to help deliver the resilience message. When and where appropriate, DHS employees should be made available to participate in these outreach activities, using such opportunities to elicit community concerns and accomplishments in concert with the recommendations in section 1.

The CRTF was pleased to learn that DHS has plans underway to leverage the upcoming 10th anniversary of 9/11 as an opportunity to promote individual and community resilience and all-hazards family preparedness, but has some concerns that the message could get lost in the fray of commemorative activities. We therefore recommend that the anniversary events be viewed as one phase of a sustained national campaign to increase public awareness regarding the resilience imperative.

Finding 2.3: Complacency is a serious threat to building and sustaining national resilience; clear communications to increase public awareness is a necessary first step, but individuals must be motivated to take action.

Instilling and maintaining a state of vigilance is extremely difficult when the threat is amorphous or viewed as unlikely from an individual or local perspective; the challenge is to effectively engage individuals without creating undue anxiety. Recognition and other incentives are commonly used by organizations to motivate and reinforce desired individual behaviors; similar mechanisms are needed to promote individual and community resilience.

Even when threats seem both clear and imminent, individuals are too often unwilling (or unable) to take action. This is particularly true for natural disasters that often are forecast such that, if appropriate actions were taken, casualties could be reduced. Motivating individuals to heed evacuation mandates has proven particularly problematic in recent disasters. The counter-example in the vignette at right illustrates the value of learning how to motivate individual action.

San Diego Wildfires: Lessons Applied

On October 20, 2007, wildfires erupted in Southern California, spanning an area from Santa Barbara County to the U.S./Mexican border. 1500 homes were destroyed and over 500,000 acres of land were burned; 9 people lost their lives and 85 more were injured. By October 23, 500,000 people in San Diego County had mandatory orders to evacuate. In total, 945,000 people evacuated into shelters across the county. In the aftermath of similar wildfires in 2003, both San Diego County and City installed telephone reverse call-down emergency warning systems; findings indicate that those that received a reverse emergency warning call were much more likely to evacuate than those who did not receive a call.

Recommendation 2.3: *Motivate and Enable Action.* DHS should adapt proven incentive and award programs to motivate individual and community engagement and action; and further develop mechanisms to facilitate and enable engagement.

In tandem with Recommendations 2.1 and 2.2, DHS should assess the effectiveness of its communications programs through ongoing evaluation of whether individuals take the recommended actions, compiling lessons to enable refinement of strategies illustrated as in the San Diego vignette. Additional activities, such as those described below, should be initiated to further motivate and enable action.

DHS should implement a Homeland Security Resilience Awards Program to recognize individuals who help build and sustain operationally resilient communities. The CRTF believes a DHS-sponsored national program would enable the Department to spotlight role models for community resilience, motivating others to emulate their efforts, and notes that at least one related program already exists, as illustrated in the box at right.

Taylor Murphy Resilience Awards

The Resilience Awards is a statewide competition targeting strong, resilient businesses located in communities facing tough economic conditions.

“A finalist or winning business in this competition defines Resilience—the ability to bend but not break, to weather the storm and come out stronger for it, to thrive in the face of adversity.”

Gregory B. Fairchild, Executive Director
Taylor Murphy Center, Darden School of Business
University of Virginia: www.darden.virginia.edu

The CRTF believes that DHS should adopt 911 as the universal three-digit national security hotline linked to the ‘If You See Something, Say Something’ campaign. At present, citizens are asked to “report suspicious activity to local law enforcement or call 911.” The use of multiple reporting channels delays (and potentially impedes) the analysis and synthesis of related information. A single nationwide number for all security-related calls would be beneficial from at least two perspectives. First, it would enable analysis and trending of information; second, it would permit formal recognition of individuals who contribute high-value information via the ‘See Something, Say Something’ campaign to motivate broader participation as suggested below.

SEE SOMETHING...SAY SOMETHING

In May 2010, a New York street vendor **happened** to see an SUV smoldering in Time Square. He **chose** to do something by pointing out the vehicle to an NYPD officer.

In February of this year, workers at Carolina Biological Supply of Burlington, NC **happened** to notice a strange order from Lubbock, TX. They **chose** to contact the FBI.

Similarly, employees of Con-Way Freight in Lubbock **received** a package they deemed suspicious and **chose** to notify their internal security department in Ann Arbor, MI.

These ordinary citizens became local heroes because they did in fact, “See Something, Say Something.” No one knows how many lives their actions may have saved or how much property damage was averted by following the simple direction of the DHS campaign. Both the individuals and the employers enjoyed their “15 minutes of fame.”

Today most Americans could not name Carolina Biological Supply or Con-Way Freight nor identify Lance Orton, the New York street vendor. Their legacies should have been captured, recognized and used as models for the program. The President and his Cabinet travel frequently; a stop to present a plaque, shake hands and pose for pictures might motivate others to See Something, Say Something. These people **chose** to make a difference: perhaps altering the course of history.

3.0 Urban Planning for Resilient Communities

Urban and regional planners develop long and short-term plans for the use of land and the growth and modernization of urban, suburban, and rural communities and the regions in which they are located. They help local officials forecast and preempt or alleviate social, economic, and environmental problems by recommending locations for roads, schools, and other infrastructure and suggesting zoning regulations for private property—to meet existing and future community continuity needs.

Urban planners play important roles in supporting new development, in community renewal/revitalization, and also in redevelopment in the aftermath of disasters. Each chance for intervention is accompanied by opportunities as well as constraints.

Urban planners are today confronting the need to build more sustainable communities; an opening exists to establish resilience as an equally important planning objective as well as to identify and leverage potential synergies between resilience and sustainability¹⁹ objectives. NGOs including the Institute for Sustainable Infrastructure, described in the box at right, provide opportunities for collaboration as well as models and measures that may be adapted to resilience initiatives.

Although urban planning occurs primarily at the local / regional level, the federal government needs a voice in order to build and sustain national resilience. Intervention opportunities exist particularly in redevelopment in the aftermath of disasters since the federal government is often called upon to support the recovery process. That role can be leveraged, however, through resilience-related policies as well as federally-backed insurance programs and grant programs targeting areas such as preparedness and critical infrastructure resilience.

**Institute for Sustainable Infrastructure (ISI)
Founded by National Engineering & Public
Works Associations**

A new, independent non-profit organization tasked with developing and administering a sustainability rating system for North American infrastructure, the ISI, is formulating a rating system founded on the “triple bottom line” concept of sustainability, which includes environmental, economic and social considerations. The system, which is designed to identify the benefits of sustainable practice for owners, regulators and practitioners, will be formally launched in the summer of 2011 as a voluntary, web-based product. The ISI system will include an option for third-party verification, and will be applicable to a wide range of infrastructure projects, from roads and bridges to energy and water systems. Its robust, objective and transparent methods will also promote community and policy acceptance of sustainable solutions and encourage knowledge sharing, innovation and collaboration in the design, construction and maintenance of infrastructure.

Joint Press Release, February 1, 2011
American Council of Engineering Companies
American Public Works Association
American Society of Civil Engineers

Most catastrophic events have two things in common: (1) they are relatively localized, but have the potential for cascading impacts and consequences; and (2) they are typically unexpected.

¹⁹ “Sustainability is a set of environmental, economic and social conditions in which all of society has the capacity and opportunity to maintain and improve its quality of life indefinitely without degrading the quantity, quality or the availability of natural, economic and social resources.” American Society of Civil Engineers (ASCE) Board-Approved definition, October 28, 2009.

These realities indicate the need for increased attention to operational resilience. Operational resilience demands deliberate, pragmatic, and innovative planning; it is distinguished from response and recovery efforts because it precipitates proactive, long-term solutions and must be central to future urban planning efforts. In the conceptual framework described in the Introduction, such planning is analogous to mitigation activities in the ‘before’ phase in that it is intended to increase the capacity to ‘resist’—reducing both the probability of failure and the consequences should failure occur (e.g., limitation of cascading effects).

The federal government has an opportunity to lead by example, using existing assets and resources to support local and regional operational resilience initiatives.

Just as the military provides MREs—Meals Ready to Eat—to our soldiers who often find themselves in harm’s way, the Federal government could help provide much needed SRGs—

Finding 3.1: The federal government has significant assets that could be leveraged to enable community resilience at modest additional cost, and an opportunity to promulgate standard approaches to build operational resilience in local communities.

Shelters Ready to Greet—to Americans who find themselves in harm’s way on the home front. Such an initiative would improve a community’s capacity to absorb the impact of an adverse event.

The U.S. General Services Administration (GSA) is the landlord²⁰ of the Federal government. GSA owns or leases over 354 *billion* square feet of office space in over 8,000 buildings nationwide

on behalf of numerous Federal departments and agencies. A small percentage of these assets are today designated ‘shelters in place,’ capable of providing safe refuge to area residents caught in the throes of a local disaster; the CRTF sees great value in increasing that percentage.

The Oklahoma City Bombing in 1995 and the terrorist attacks on September 11, 2001 dramatically increased GSA’s long-term resilience-based continuity planning for Federal facilities. Subsequently, the government established new security standards for its facilities, which led to a new set of procurement requirements. All new Federal buildings are designed to meet the higher security standards, and in the decade since 9/11, GSA has made great strides in hardening its existing real estate portfolio to protect the Federal workforce.

Every DHS/FEMA plan, assessment tool, and pre-scripted Mission Assignment includes a housing/shelter requirement. In a disaster situation, the plans outline the immediate deployment of equipment, such as the U.S. Army Corps of Engineers’ portable generators, fresh-water trucks, and portable phone clusters.

If GSA were to require accommodations for common exterior connections for portable electricity, water, and communications infrastructure (voice and data) for select Federal facilities, the ability of emergency responders to address the needs of the local community would increase dramatically. The need for ad-hoc evacuations and communications could be greatly reduced, while also minimizing impacts on the continuity of critical community services and government operations. Under normal circumstances, government work in the retrofitted

²⁰ Attached is a web link that will lead to a complete state-by-state listing of federal facilities. www.iolp.gsa.gov/iolp/NationalMap.asp

buildings would be unaffected. In the event of a disaster, however, regular government operations might be interrupted to support protection of the public (though it is likely that operations would suspend regardless).

With GSA’s extensive real estate portfolio of well-maintained and often fortified buildings, there is enormous potential for DHS to partner with GSA to increase the number of shelter in place locations in federally owned buildings throughout the Nation. CRTF members believe that by using GSA’s purchasing power, the cost to retrofit existing Federal assets to serve as SRGs would be reasonable. Likewise, the Federal government could help communities procure materials necessary to renovate other local infrastructure, including office buildings, schools, and training facilities, to function as safe havens for minimal cost. Over time, Shelters Ready to Greet could become the norm rather than the exception among Federal facilities, and in the process of creating them, America will build capabilities that better ensure the protection of its citizens and the operational resilience of its communities.

Through a series of strategic investments, the DHS/GSA partnership could help jump-start a national push for community resilience at a reasonable cost, especially considering that the cost

Recommendation 3.1: Leverage Existing Federal Assets. DHS, in conjunction with the General Services Administration and local officials, should develop a Resilient Community Initiative (RCI) that leverages federal assets and programs to enable community resilience.

to recover from a catastrophic event is likely to be substantially greater²¹ than what it costs to prepare for such an occurrence.

Consistent with local conditions, a Resilient Community Initiative (RCI) would develop building codes and corresponding procurement requirements to accommodate necessary disaster infrastructure in select public facilities.

include major renovation projects for new and existing federally-owned facilities with an emphasis on building operational resilience. Members perceive an opportunity to leverage the approximately \$23 billion that FEMA and DHS have provided for state and local projects over the past five years to encourage and incentivize communities to adopt similar procurement regulations.

The CRTF also believes that DHS and GSA should craft requirements for new Federal construction to

DHS and FEMA have begun a "bottom up review" of Public Assistance (PA) under the Stafford Act with the intended purpose of making the grant program more flexible to the grantee and sub

Finding 3.2: Legacy grant programs do not effectively support building and sustaining the resilience of the built environment in communities throughout the Nation.

grantee while still ensuring accountability to the taxpayer and compliance with Federal statutes and requirements. They should be applauded for this effort and their interest in making the program more effective and responsive.

Throughout this review, creation and sustainment of community resilience should be a major consideration in evaluating the success of the PA Grant Program as well as the backdrop for any recommended changes. In addition, other DHS grant programs

²¹ See Appendix I for references providing a spectrum of relevant cost/benefit estimates.

should be reviewed to assure that statutory language, policies and procedures (including interpretation of these policies and procedures) enable and promote operational resilience initiatives.

For example, current interpretation of the Hazard Mitigation Grant Program under the Stafford Act only allows the use of mitigation funding in the construction of ‘36 hour’ safe rooms, which are effective for tornados and other disasters that may require 36-hour sheltering, but not for disasters such as hurricanes where sheltering for longer periods of time is often necessary. This interpretation limits the ability of communities to build longer term shelter capacity as close to the impact area as safely possible; such ability would enable individuals and families to return to their homes and businesses quickly, thereby helping their communities recover more rapidly. The box at right illustrates the impact of this constraint during Hurricane Gustav.

Louisiana’s recovery efforts from the infrastructure devastation due to back-to-back hurricanes in 2005 have also been constrained by legacy grant programs as illustrated in the box at right.

Homeland security grant programs provide myriad other funding mechanisms that could be used to enhance the operational resiliency of states and local communities throughout the Nation. The Homeland Security Grant Program (HSGP), consisting of five grant programs that include State Homeland Security Program (SHSP), Urban Areas Security Initiative (UASI), and the Emergency Management Performance Grants (EMPG), are large programs that if better synchronized could allow state and local governments to develop more comprehensive resilience requirements and spending plans to make community resilience a certifiable and sustainable nation-wide reality. These grants, and others like the Port Grants, Fire Grants

Hurricane Gustav

During Hurricane Gustav in 2008, the Federal Government spent over \$100.0 million dollars to evacuate and shelter individuals and families needing assistance. This delayed bringing communities back on line and was much more expensive (and burdensome to the sheltering states). The cost to evacuate these citizens needing assistance by air, rail, and coach bus, was significantly more expensive than evacuation by school bus and caused greater delay in recovery than sheltering closer to or even within the impact area. While Louisiana is working toward being sheltering independent, the "36 hour safe room" interpretation does not allow the State to use currently available Hazard Mitigation Grant Funding to build new or harden existing shelter facilities.

2005 Louisiana Hurricanes

South Louisiana was devastated by infrastructure and recovery failures associated with two back-to-back hurricanes in 2005 – Hurricanes Katrina and Rita. Almost six (6) years after the storms, recovery is less than 40% complete. Louisiana’s experience has been that the Public Assistance Grant Program is extremely cumbersome because it is based on regulations requiring a building by building approach to recovery. Communities need a new, integrated, and broader approach using solid planning support, which in many cases is beyond the community’s capability, and a “whole of community” approach to empower predictable response and recovery. Simply bringing a damaged facility back to its pre-storm condition does not necessarily restore the community, and does not foster the operational resiliency necessary to anticipate, prepare for and ensure the community can survive and efficiently cope with the next event with the attendant human, property, economic and social consequences.

and grants administered through the Department of Health and Human Services, tend to be departmentally and functionally stove-piped, thus inhibiting a more comprehensive and integrated planning and execution process.

Recommendation 3.2: *Align Federal Grant Programs to Promote and Enable Resilience Initiatives.* DHS should review and align all grant programs related to infrastructure or capacity building, and should support development of synchronized strategic master plans for improvement of operational resilience throughout the Nation.

The CRTF observes that in the Press Release²² announcing grant guidance for fiscal year 2011 preparedness grants, ‘resilience’ was mentioned only three times (Transit Security, Freight Rail Security, and Intercity Passenger Rail); this represents a missed opportunity to make the connection between preparedness capabilities and resilience outcomes.

DHS should expand the scope of its ‘bottom up’ review of grant programs to encompass the full portfolio of relevant programs, ensuring they are not stove-piped and are promoting an integrated ‘whole of community’ approach to building operational resilience. The ‘bottom up’ review should assess the need for planning support for communities to help them build local ‘master plans’ for use by urban planners and others whose activities impact the community’s operational resilience. Sustainability considerations should be integrated into the master plans when feasible.

A model that may provide useful lessons is provided by the experience and approach adopted by Greensburg, Kansas, which chose to rebuild a community markedly different from the town destroyed by a tornado in 2007, as illustrated in the box at right.

In support of the recommendation for ‘Shelters Ready to Greet,’ CRTF members believe the interpretation of the Hazard Mitigation Grant Program should be broadened from safe rooms to allow for the construction or hardening of operationally resilient mass care shelters.

Greensburg, Kansas

On May 4, 2007, Greensburg, Kansas was hit by an EF5 tornado, which destroyed 95% of the city and severely damaged the remainder. Greensburg is working to rebuild in an environmentally sustainable way in accordance with its “Greensburg Sustainable Comprehensive Plan.” The plan introduction notes that “this is not about disaster recovery but instead a strategy to benefit from an opportunity to build replicable systems capable of change from the ground up.”

<http://greensburgks.org/recovery-planning>

This thorough review of all existing FEMA grant programs is to ensure that they are complementary, encourage public-private partnerships, and support community resilience efforts throughout the Nation; it is a necessary first step. Subsequently, DHS should exercise its leadership role in building national resilience to work with other federal departments and agencies (e.g., Health and Human Services) to align and synchronize their relevant grant guidelines and procedures such that they also help build and sustain operational resilience throughout the Nation.

²² Press Release text is provided in Appendix H.

Homeland Security Presidential Directive 7 (HSPD-7) defined U.S. policy for critical infrastructure protection and established a framework for stakeholders to identify, prioritize, and

Finding 3.3: The sector-focused approach that dominates critical infrastructure planning at the federal level does not effectively support community-based resilience initiatives.

protect the critical infrastructure in their communities, with emphasis on protection from terrorist attacks. The directive defined 17 critical infrastructure sectors and designated a federal Sector-Specific Agency (SSA) to lead protection and resilience-building programs and activities within each. [DHS established an 18th sector, the Critical Manufacturing Sector, in March 2008.]

Local communities represent nodes at the intersections of multiple critical infrastructure sectors, each of which has planning considerations and drivers that extend well beyond the confines of a single community. There are, nonetheless, shared interests; communities cannot build operational resilience absent resilient infrastructure systems to deliver essential services. At the same time, local governments make decisions that could impact the resilience of infrastructure systems (e.g., channeling of back-up cables into close proximity to conserve right-of-way but creating a single point of vulnerability to disruption). Rather than planning sector-by-sector (infrastructure-by-infrastructure), however, urban planners employ a holistic, community-centric approach that is not well-matched to the sector-focused methodology of the federal government.

Infrastructure systems are degrading throughout the Nation. Public funding for essential systems is at an historic low level, and future funding is uncertain. Communities see a growing list of needs absent the resources to address them. Public infrastructure enables modern civilization, but all infrastructure systems are not of equal importance; furthermore, an infrastructure system that is vital to one community may be far less critical to another. Individual communities must identify those systems that are essential to maintain daily life and facilitate rapid recovery from disaster, and implement an integrated approach to build and sustain the resilience of those infrastructures. The sector-focused approach that is central to federal planning for critical infrastructures is of limited value in helping communities analyze and prioritize investment options.

Recommendation 3.3: *Enable Community-Based Resilient Infrastructure Initiatives.* DHS should transform its critical infrastructure planning approach to more effectively enable and facilitate communities in their efforts to build and sustain resilient critical infrastructures.

DHS should meld its top-down sector-focused planning methodology with a bottom-up community-based approach to facilitate and support urban planning as well as other local efforts to enhance operational resilience; it also should ensure that infrastructure-related grants explicitly motivate and support community-based operational resilience initiatives.

Communities can enhance operational resilience by taking positive steps to overcome known vulnerabilities before a disaster occurs. One good example is the ability to maintain adequate electrical power to crucial facilities and emergency responders. Modern society is totally dependent on receipt of dependable power, but disasters can destroy or disrupt the electrical grid. A community should identify those facilities that must function no matter what happens.

Rather than depending on the electrical grid to survive the disaster, the community could elect to provide on-site electrical generators to power critical equipment. By providing on-site power, emergency responders never lose communication or the ability to review emergency planning actions. Moreover, critical water systems will stay on line and other identified essential systems will continue to operate. Positive action ahead of time is a great step towards rapid recovery. The CRTF notes that stakeholders are already taking action to improve the operational resilience of key infrastructure components. Two examples are highlighted below.

To increase the number of sites available for use as public shelters during emergencies, Maryland's Interagency Committee on School Construction (IAC) is in the process of implementing regulations to require that each project proposing the construction of a new school or the upgrade of the electrical system at an existing school include the wiring to accept emergency electrical power from mobile generators. Pre-wiring school facilities to receive mobile generators as they are built is a cost-effective way to increase the number of public shelter sites that have full backup electrical power capabilities and are able to provide the FEMA-required Functional Needs Support Services elements for emergency shelters.

Post-Katrina Maryland Legislation

In the wake of Hurricane Katrina, the State of Maryland passed legislation (House Bill 770, "Emergency Plans for Human Services Facilities") requiring long term care and larger assisted living providers with 50 or more residents to develop emergency preparedness plans to address the continuity of operations within their facilities in the event of an emergency or disaster. Built upon lessons learned from Hurricane Katrina, the plans must address: notifications to family and staff; notification and consultation with the State government; staff coverage, organization, and assignment of responsibilities in an emergency; procurement of essential goods, equipment and services; a relocation plan for residents to alternative facilities; and evacuation, transportation, and shelter in place plans for residents. Maryland's Department of Health and Mental Hygiene's Office of Health Care Quality (OHCQ) oversees management and execution of the program, which has included providing training on emergency preparedness across the state, an annual survey process to review whether facility emergency plans are in compliance, and partnering with the industry to facilitate additional training among providers. OHCQ has also established, as best practices, an audit of emergency generators to ensure that the facilities are capable of sheltering in place for at least 72 hours, and developed a checklist template for use by all facilities, which is available on the OHCQ's website to assist in the facilities' development of Emergency Plans.

Louisiana is developing a Business Emergency Operations Center to facilitate better communication and coordination through public-private partnerships.

Louisiana Business Emergency Operations Center

Through a Cooperative Endeavour Agreement, Louisiana has used EMPG funds to begin developing the Louisiana Business Emergency Operations Center (LABEOC). A stand-alone facility, the LABEOC is interconnected with the State EOC in Baton Rouge. It is designed to improve disaster preparedness and response by:

1. Improving communications to and from business and industry before, during, and after a disaster;
2. Utilizing a business model when more efficient and cost effective to respond to resource and other requests; and
3. Leveraging the critical infrastructure representatives in the LABEOC to help bring communities back online while receiving real-time economic impact information important in determining level of state and federal assistance.

The LABEOC also facilitates better communication and coordination through the public-private partnerships with the requests and needs of nonprofits through national and state VOADs. This model has gained the attention of DHS, and neighboring Gulf states, which have expressed interest in establishing Business Emergency Operations Centers within their own states.

Examples such as those described above provide valuable models that could be emulated by other states and local communities; DHS should facilitate the sharing of local initiatives as it promotes critical infrastructure resilience throughout the Nation.

No discussion of resilience of critical infrastructure is complete without addressing the issue of sustainability, bringing economic, environmental, and social impacts into the consideration of how communities are built. Resilient infrastructures need not degrade natural, social, and economic resources, as illustrated in the vignette at right. DHS should promote the coupling of resilience and sustainability initiatives in urban planning and redevelopment.

Embedded Sustainability

A major roadway that serves as a critical avenue of evacuation, a relief supply route, or an emergency responder thoroughway could be designed to include recycled materials, bio-swales to improve stormwater quality, and native landscaping to enhance the area while providing for critical functionality.

Finding 3.4: Individual communities may be severely impacted by infrastructure failures outside their local control.

The Nation is empowered by critical, complex, and interdependent cyber and physical infrastructure systems. While essential to the conduct of every facet of daily life, many of these systems are old, overstressed, inconsistently maintained, and vulnerable to attack and/or exploitation. Moreover,

these complex systems may contain ‘single points of failure’ that can lead to costly and cascading effects, as was demonstrated by the Northeast Blackout of 2003 (see box below).

While individual communities cannot prevent occurrence of catastrophic failures of critical infrastructures, they must understand the likelihood and implement strategies to mitigate the potential consequences.

A more localized example is provided by the Port of Baltimore. A terrorist attack—or a severe accident—at that port could lead to a complete port closure and, depending on the level of uncertainty surrounding the incident, could lead to other port closures as well. Such an event could impact geographically distributed regions of the Nation. The result would be to severely disrupt supply chains and the flow of critical commodities like oil with immediate and cascading effects for the entire region and perhaps the Nation as a whole.

Northeast Blackout of 2003

“On August 14, 2003, large portions of the Midwest and Northeast United States and Ontario, Canada, experienced an electric power blackout. The outage affected an area with an estimated 50 million people and 61,800 megawatts of electric load...power was not restored for 4 days in some parts of the United States. Parts of Ontario suffered rolling blackouts for more than a week before full power was restored. Estimates of total costs in the United States range between \$4 billion and \$10 billion (U.S. dollars). In Canada, gross domestic product was down 0.7% in August, there was a net loss of 18.9 million work hours, and manufacturing shipments in Ontario were down \$2.3 billion (Canadian dollars).”

U.S.-Canada Power System Outage Task Force
Final Report on the August 14, 2003 Blackout
<https://reports.energy.gov/BlackoutFinal-Web.pdf>

Community leaders are today limited in their ability to assess the local implications and vulnerabilities as a result of failure(s) of some element(s) of the Nation’s critical infrastructure,

and must therefore work to develop mitigation initiatives to improve operational resilience in the aftermath of such system failures.

Recommendation 3.4: *Enable Community-Based Resilience Assessment.* DHS should coordinate development of a community-based, all-hazards American Resilience Assessment (ARA) methodology and toolkit.

The CRTF recommends development of an American Resilience Assessment (ARA) methodology and toolkit to help communities identify risks, develop community resilience requirements, and where appropriate, build adaptive capacities (e.g., alternate logistics paths) to mitigate potential impacts from critical infrastructure failures.

The CRTF noted that resilience provides a unifying objective for a risk-based framework within which individual initiatives and strategies can be more effectively described and prioritized. The ARA should be developed within this context and should establish the relationships between threat, vulnerability, and consequence—the basic components of risk—as they relate to resilience. Research on economic resilience cited earlier describes risk-based outcomes that may also be useful in this regard: *reduced failure probability, reduced consequences from failure, and reduced time to recovery*²³. The ARA must explicitly address probability as it relates to the threat assessment and thus impacts the risk equation; important probability considerations are highlighted in the box that follows.

Probability Considerations

In the design of critical infrastructure, the concept of probability as used in design is really another name for “probably” when evaluating whether a natural disaster could occur. Creating resilient communities will require us to make distinctions between infrastructure that is critical (potable water, emergency transportation) and infrastructure that is important (drainage courses, local roadways). Designers are tasked with creating facilities that meet published design codes and criteria. Those codes may not adequately prepare a community for probable natural disasters.

For example, levees in the US are routinely designed to protect from the 100-year event. This event has a probability of 1% of occurring every year. Engineers and meteorologists will tell you that a 100-year event will definitely occur at some point. The general public, seeing massive structures, may be lulled into a false sense of security about their safety. The levees of New Orleans remain a prominent example of this problem. Resilient communities may select more stringent design criteria for critical infrastructure systems to better protect against disasters and support rapid recovery.

The ARA should be developed in collaboration with the private sector and professional associations, and should include a lessons-learned and best practices sharing mechanism to help design and build operational resilience into all facets of community planning throughout the Nation. It also should serve as an education and awareness tool, enabling urban planners and local leaders to better understand their respective roles in building community resilience.

The CRTF believes that development of the ARA should be informed by related tools and methodologies that can be found in the research literature, but that additional resilience-specific research will be required as described in Recommendation 1.4 to develop a methodology that is useful across the diverse homeland security enterprise.

²³ Rose, Adam (2004). “Defining and Measuring Economic Resilience to Disasters.” *Disaster Prevention and Management: Volume 13, Number 4*, pp. 307-314. © Emerald Group Publishing Limited. ISSN 0965-3562.

The BART vignette below illustrates several aspects of the envisioned ARA methodology, including incorporation of lessons-learned as well as risk-informed design trades.

Bay Area Rapid Transit (BART) System Lessons-Learned

Using new knowledge developed following the Kobe and Los Angeles earthquakes, BART conducted a vulnerability study of the transit system and its performance under a maximum credible event---occurring on various faults in the service area. A retrofit program was designed to two different standards---a life safety non collapse standard and a more robust rapid return to service designed to expedite the recovery and return to service following a major event. This \$1.3 billion program had to be largely "self funded" with funds BART could generate rather than access or rely on existing state and federal funding programs which were inadequate to meet this need.

BART embarked on a major voter education campaign to explain the need for and the higher reliability results of this investment program. The funding to be used was a renewal of a property tax backed General Obligation Bond requiring 2/3rds voter approval. It took two tries to win the necessary votes, but the second time was successful. The 10 year construction program is well underway, on schedule and ahead of the budget, which is allowing BART to expand the reach of the higher standard "rapid return to service" work to cover more territory.

A resilient cyber infrastructure is an increasingly important enabler of community resilience. The CRTF did not separately consider this highly complex and interdependent infrastructure, but the recommendations above are applicable to this domain as well as to physical infrastructures. A more targeted study would be needed, however, to identify issues and impediments specifically related to the cyber infrastructure contribution to community resilience.

Conclusion

The CRTF commends DHS for identifying resilience as a foundational element for the homeland security mission and observes that many relevant activities are underway. At the same time, however, the CRTF observes that relevant activities are rarely linked explicitly to resilience outcomes; thus, there is little appreciation for the fact that steps are being taken that will, over time, enhance national resilience.

The single most urgent action needed is clear articulation of the relationships between resilience, preparedness, and risk within the homeland security mission context. This is crucial both to build shared understanding across diverse stakeholder communities and to motivate action throughout the Nation. A more integrated approach also offers opportunities to identify and leverage synergies across programs, enabling conservation of scarce resources. The CRTF offers a conceptual framework in Figure 1 as a starting point for this effort. The findings and recommendations described in sections 1-3 will be most effective if they build from a coherent view of these interdependent relationships.

Appendix A

HOMELAND SECURITY ADVISORY COUNCIL

Community Resilience Task Force: Tasking

The Quadrennial Homeland Security Review (QHSR) was integral in providing a framework for both building and defining the term “resilience,” which is defined as “the promotion of individual, community, and system robustness, adaptability and capacity for rapid recovery.”

Resilience initiatives emerging out of the QHSR provide comprehensive, risk-based, all-hazards performance metrics and capacities to prevent or mitigate known hazards. This definition goes beyond the historical implication of “disaster preparedness.” Resilience efforts provide cogent means of how one can invest in and predictably ensure the provision of critical infrastructure services, and by extension, the continuity of essential citizen, business, community, and national functions.

Within this context and over the course of the next year, the Community Resilience Task Force will provide the Secretary with recommendations on how the Department can ensure the rapid and more effective infusion of resilience in programs and practices throughout the Nation. The HSAC will stand up a Task Force to address areas of resilience, focusing on resilience within transportation, business, grants, building and design, community preparedness. In particular, the Task Force will study and provide the Secretary actionable recommendations addressing the following questions on individual and community resilience and the planning and resources listed below.

Individual and Community Resilience

1. How can we increase individual and community engagement and participation in resilience capacity building and sustainment?

Planning and Resources

1. How should we build, design, and incorporate security and resilience into urban planning?
2. How can we better plan and resource acquisition across the federal government in support of national, regional, state, tribal, local, and individual resilience efforts?

Appendix B

Homeland Security Advisory Council

Community Resilience Task Force Membership

Name	Title, Organization
Martin O'Malley	Governor, State of Maryland (Chair)
Ruth David	President and CEO, Analytic Services, Inc. (Vice Chair)
Jeff Moss	Vice President and Chief Security Officer, Internet Corporation for Assigned Names and Numbers (Vice Chair)
Ruben Barrales	President and CEO, San Diego Regional Chamber of Commerce
Sandra Lopez Burke	Vice President and Executive Director, City Year
Mark Cooper	Director, Louisiana Governor's Office of Homeland Security and Emergency Preparedness
Darrell Darnell	Senior Associate Vice President for Safety and Security, George Washington University
Lynn Davis	Director of Washington Office, RAND Corporation
Dorothy Dugger	General Manager, Bay Area Regional Transit (BART)
Mohamed Elibiary	Founder, Lone Star Intelligence, LLC
Stephen Flynn	President, Center for National Policy
Howard Gordon	Writer and Producer, 24
LTG Russel L. Honoré	LTG (Ret) US Army, Commander Task Force Katrina
Allen Kay	Chairman and CEO, Korey Kay and Partners
D. Wayne Klotz	President, Klotz Associates, Inc.
Carie Lemack	Co-Founder, Families of September 11
William McDonough	Founding Principal, William McDonough + Partners
Roxane Cohen Silver	Professor, University of California at Irvine
Dennis Walaker	Mayor, City of Fargo, North Dakota

We'd like to thank the following for their contributions towards the task force's efforts:

C. WM. Booher, Jr. Executive Vice President & Chief Operating Officer, Council on Competiveness

Ken Alston Chief of Staff, William McDonough + Partners, MBDC, McDonough Consulting

HSAC STAFF

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Appendix C

Subject Matter Experts

Name	Title, Organization
Paulette Aniskoff	Director of ICPD/Citizen Corps, Federal Emergency Management Agency
Sue Armstrong	Deputy Assistant Secretary of Infrastructure Protection, National Protection and Programs Directorate
Jeffrey Dell	Senior Vice President, Senior Business Continuity Manager – Corporate Bank of America/Global Resiliency Management
Warren C. Edwards	Director, Southeast Regional Research Initiative & the Community and Regional Resilience Institute, Oak Ridge National Laboratory
Jeffrey Gaynor	Founder, American Resilience Consulting, LLC
David K Haygood	Partner, IDEO
David Heyman	Assistant Secretary, Office of Policy, Department of Homeland Security
Mike Kangior	Director, Emergency Management Policy, Office of Policy, Department of Homeland Security
David J. Kaufman	Director, Office of Policy and Program Analysis, Federal Emergency Management Agency
Jenny Menna	Director, Critical Infrastructure Cyber Protection & Awareness, National Protection and Programs Directorate
Karen Marsh	Director, Citizen Corps, Federal Emergency Management Agency
Bridger McGaw	Director, Private Sector Office, Office of Policy, Department of Homeland Security
Suzanne Novak	President of Erudyne, LLC
Keith Turi	Senior Policy Advisor, Office of Policy & Program Analysis, Federal Emergency Management Agency
Ji Sun Lee	Program Manager, Human Factors Division, DHS Science and Technology Directorate
Wayne Young	Security Specialist (Port) and Assistant Chief, Domestic Ports Division, United States Coast Guard

Appendix D

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Appendix E

Recommendations Specific to NGOs

NGOs have the requisite capacities and capabilities (response reliability) to ensure the operational resilience of and leverage the strengths of both for-profit and non-profit NGOs, for specific phases of disaster preparedness, response, and recovery.

- Develop the assessment tool for determining whether a NGO (or NGO network) has the infrastructure, operational capacity, and prior experience for adequately responding to the needs of community members. The tool would include information to help predict which NGOs are most likely to be successful in response and recover operations; and which have the ability to manage funds and other resources.
- Conduct an NGO capabilities assessment and identify opportunities for funding NGO operational resilience requirements from existing federal programs.
- Test the assessment tool in a set of demonstration communities.

Conduct a benefits assessment of NGO involvement, to inform appropriate resource allocation and expectations for future involvement.

- Determine the costs associated with national NGO involvement in disaster preparedness, response, and recovery.
- Evaluate the financial and non-financial benefits associated with national NGO leadership in supporting emergency planning and long-term recovery at the local level. Determine whether their NGO activities result in cost savings to other sectors.

Create an incentive system to motivate individual resilience efforts and the movement toward community resilience.

- Develop an incentive structure (e.g., monetary, other) to motivate proactive, self-sufficient behaviors (e.g., storing water, food and medicines to ensure their availability for a pre-determined period of time) and the movement toward community resilience (e.g., community connections and supports for operationally resilient response and recovery and infrastructure service provision). Once there is an evidence base to inform this incentive structure, funding can be allocated for community-level interventions.
- Test the incentive structure with NGO involvement.

Develop a data system for capturing information from NGOs in disaster response and recovery.

- Develop a pilot system for NGOs to report information on community health indicators and assets using handheld technology that quickly feeds into a centralized database or scorecard used by local health officials, local government, and other local decision makers for, emergency planning and response, and community continuity and operational resilience.
- Test the Pilot system with a sub-set of NGOs and validate the data entered to verify its accuracy.

Appendix F

City of Fargo and FEMA's Regulations



Mayor Dennis R. Walaker
200 3rd Street North
Fargo, North Dakota 58102
Phone (701) 241-1310
Fax (701) 476-4136

May 12, 2011

Mr. John Minnick
Homeland Security Advisory Council
Department of Homeland Security
245 Murray Lane, Building 410
Washington, DC 20528

Dear Mr. Minnick,

I want to thank you for allowing me to participate in the Homeland Security Advisory Council's Community Resilience Task Force. Living in Fargo, North Dakota, along the Red River of the North has taught all our citizens the meaning of resiliency when it comes to flooding.

An issue that we discussed during the Task Force sessions was federal agencies' inflexibility with rules and regulations. I would like to give you an example of this and how a small change would provide additional security to our citizens and their properties. I have also attached proposed legislation to be introduced by U.S. Senator John Hoeven to address a FEMA rule relating to federally funded buyouts and the restrictions placed on those properties by FEMA.

FEMA has a buyout assistance program which provides funding to purchase flood prone properties. In the fertile but flat Red River of the North valley (which extends from the South Dakota border into Manitoba, Canada) along the eastern border of the state, flooding has been a persistent problem during the spring time. Fargo has experienced eleven spring time floods since 1978, and four since 1997 are in the top 10 floods of record since flooding data has been kept starting back in the mid-1800s. In the off years since 1997, when floods of record are not occurring, the Red River has reached major flood elevations.

Since 1997 the City of Fargo has purchased over 250 homes that were near the Red River floodway and at lower elevations. Early in the process the City used FEMA HMGP funds to purchase and remove homes. Following federal rules, relocation payments were made, the structures demolished and the surrounding area was restored.

FEMA regulations prohibited the City from elevating the property to higher reaches, which would have protected neighboring homes off the river and across

the street from future flooding. Consequently, every spring the City has to provide emergency clay or structural levees on these FEMA purchased lots, only to have these levees removed once the water recedes. Senator Hoeven's proposed legislation removes the requirement of keeping the purchased lots at natural elevation grades and allows for permanent levee construction on these lots.

The basic significant difference is what is a structure? We don't feel increasing our protection level through the removal of the structures, backfilling with compacted clay, topsoil and seeding of grass constitutes a structure.

Support of the changes in the FEMA land acquisition rules or regulations as prescribed in Senator John Hoeven's proposed legislation would provide a long term solution to a persistent flood protection problem. Thank you for seeking my input on how our City can become more resilient against a persistent problem.

Sincerely,

A handwritten signature in black ink, appearing to read "Dennis R. Walaker".

Dennis R. Walaker
Mayor

DRW:se
Enclosure
wwhsresiliencyt11

112TH CONGRESS
1ST SESSION

S. _____

To authorize the construction of levees on property acquired under hazard mitigation grant programs of the Federal Emergency Management Agency.

IN THE SENATE OF THE UNITED STATES

Mr. HOEVEN introduced the following bill; which was read twice and referred to the Committee on _____

A BILL

To authorize the construction of levees on property acquired under hazard mitigation grant programs of the Federal Emergency Management Agency.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “FEMA Common Sense
5 and Cost Effectiveness Act of 2011”.

6 **SEC. 2. CONSTRUCTION AND MAINTENANCE OF LEVEES.**

7 (a) STAFFORD ACT.—

8 (1) PREDISASTER MITIGATION PROGRAM.—Sec-
9 tion 203(e) of the Robert T. Stafford Disaster Relief

HEN11251

S.L.C.

2

1 and Emergency Assistance Act (42 U.S.C. 5133(e))
2 is amended by adding at the end the following:

3 “(3) PERMISSIBLE CONSTRUCTION OF LEVEES
4 ON ACQUIRED LANDS.—If financial assistance pro-
5 vided under this section is used to acquire or accept
6 property for open space purposes, the President
7 shall permit the construction or maintenance of a
8 levee on any such acquired or accepted property,
9 notwithstanding any requirement that the property
10 be dedicated and maintained in perpetuity as open
11 space for the conservation of natural flood plain
12 functions.”.

13 (2) HAZARD MITIGATION GRANT PROGRAM.—
14 Section 404(b)(2)(B) of the Robert T. Stafford Dis-
15 aster Relief and Emergency Assistance Act (42
16 U.S.C. 5170e(b)(2)(B)) is amended—

17 (A) in clause (i), by inserting “except for
18 the construction or maintenance of a structure
19 described in clause (ii) (including a levee),” be-
20 fore “any property”; and

21 (B) in clause (ii)—

22 (i) in subclause (II), by striking “or”
23 at the end;

24 (ii) by redesignating subclause (III) as
25 subclause (IV); and

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1 (iii) by inserting after subclause (II)
2 the following:

3 “(III) a levee; or”.

4 (b) PERMISSIBLE CONSTRUCTION OF LEVEES
5 UNDER HAZARD MITIGATION PROGRAMS RELATING TO
6 FLOODS.—

7 (1) FLOOD MITIGATION ASSISTANCE.—Section
8 1366 of the National Flood Insurance Act of 1968
9 (42 U.S.C. 4104c) is amended by adding at the end
10 the following:

11 “(n) PERMISSIBLE CONSTRUCTION OF LEVEES ON
12 ACQUIRED LANDS.—If the mitigation activities funded
13 under subsection (a) include the acquisition or acceptance
14 of property for open space purposes, the Administrator
15 shall permit the construction or maintenance of a levee
16 on any such acquired or accepted property, notwith-
17 standing any requirement that such property be dedicated
18 and maintained in perpetuity as open space for the con-
19 servation of natural flood plain functions.”.

20 (2) GRANTS FOR REPETITIVE INSURANCE
21 CLAIM PROPERTIES.—Section 1323 of the National
22 Flood Insurance Act of 1968 (42 U.S.C. 4030) is
23 amended by adding at the end the following:

24 “(e) PERMISSIBLE CONSTRUCTION OF LEVEES ON
25 ACQUIRED LANDS.—If the mitigation activities funded

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1 under subsection (a) include the acquisition or acceptance
2 of property for open space purposes, the Administrator
3 shall permit the construction or maintenance of a levee
4 on such acquired or accepted property, notwithstanding
5 any requirement that such property be dedicated and
6 maintained in perpetuity as open space for the conserva-
7 tion of natural flood plain functions.”.

8 (3) SEVERE REPETITIVE LOSS PROGRAM.—Sec-
9 tion 1361A(g)(1) of the National Flood Insurance
10 Act of 1968 (42 U.S.C. 4102a(g)(1)) is amended by
11 inserting before the period at the end the following:
12 “, including that the Administrator shall permit the
13 construction or maintenance of a levee on such prop-
14 erty, notwithstanding any requirement that such
15 property be dedicated and maintained in perpetuity
16 as open space for the conservation of natural flood
17 plain functions”.

18 (c) APPLICABILITY OF AMENDMENTS.—The amend-
19 ments made by this section shall apply to all property ac-
20 quired or accepted pursuant to section 203 or 404 of the
21 Robert T. Stafford Disaster Relief and Emergency Assist-
22 ance Act (42 U.S.C. 5133 and 5170c) or section 1323 or
23 1366 of the National Flood Insurance Act of 1968 (42
24 U.S.C. 4030 and 4104c) before, on, or after the date of
25 enactment of this Act.

THE FEMA COMMON SENSE AND COST EFFECTIVENESS ACT OF 2011

Senator John Hoeven

Background

As North Dakota communities along the Red River Valley once again mount a brave fight against rising waters, local officials are mounting another struggle – this one against an inflexible FEMA rule that prevents the region from taking a simple, common-sense step to protect lives and property.

In North Dakota alone, temporary levees have been constructed year after year, only to be removed at the end of flooding season, incurring significant costs to FEMA and local communities. The reason for this is that current FEMA policy does not allow for flood mitigation structures to be constructed on property acquired under the hazard mitigation grant program. In areas of frequent flooding, FEMA's policy results in funding being used repeatedly to construct temporary levees.

Building levees once in North Dakota's Red River Valley or any other community like it – and leaving them in place – will provide better flood protection for people and property, better management by FEMA, and better stewardship for taxpayer dollars.

Summary

This bill authorizes the construction of levees on property acquired under the hazard mitigation grant program of FEMA. Under current FEMA policy, a deed restriction is recorded on property acquired using FEMA funds, prohibiting construction of structures on that property.

The FEMA Common Sense and Cost Effectiveness Act of 2011 would save money by allowing permanent levees to be constructed. This solution is more cost effective than requiring that temporary structures be re-built each time a major flooding event occurs.

Cost Savings

CBO does not believe this bill would have a score.

In Cass County, North Dakota alone, the cost to construct temporary levees this year is \$400,000 – the third year in a row such levees have been constructed. These levees could be permanent, but because of current law, they will be removed at the end of the flood season. Furthermore, these levees have been constructed on roads surrounding previously acquired FEMA property because not even the temporary construction of levees is permitted under current law. The estimated cost to reconstruct these roads is \$2,000,000.

Appendix G

Subcommittee on National Security, Homeland Defense and Foreign Operations
Committee on Oversight and Government Reform
2157 RAYBURN HOUSE OFFICE BUILDING, WASHINGTON, DC 20515
Statement of Record
April 14, 2011
Brigadier General Mike Caldwell, Interim Director
Emergency Management Agency
State of Oregon

'Tsunami Warning, Preparedness, and Interagency Cooperation: Lessons Learned'

Thank you for the opportunity to submit a written statement for the record on today's important hearing before the Subcommittee on National Security, Homeland Defense and Foreign Operations. The topic of tsunami preparedness is especially relevant in light of the recent 9.0 M earthquake and resulting tsunami on March 10, 2011. The impact of this event was felt all around the Pacific basin, with the tsunami reaching, and causing \$7 million in damage in Oregon. There was no loss of life in Oregon from the tsunami due to previous education and outreach funded by such sources at NOAA through the National Tsunami Hazard Mitigation Program, state, and local sources.

Tsunami hazard in Oregon

The 9.0 magnitude Japan earthquake on March 10, 2011 created a subsequent tsunami on the U.S. West Coast. In most instances, the tsunami impacts were negligible, although there were areas of localized damage. One person was killed when swept off a rock near Crescent City, California as he was taking photographs of the event. In Oregon, our impact was small except in the Port of Brookings on our southern coast.

At 1035 hours, approximately 3 hours after the tsunami warning center predicted the first wave would arrive on the Oregon coast, an 8 to 10 foot wall of water struck the Port of Brookings Harbor and caused an estimated \$6.7 mil in damage. This is a small port but a very important port for our south coast and supports 60 commercial fishing vessels, 342 sport/recreation pleasure craft and it's recognized as the easiest bar crossing on our entire coast. The fishing industry is the number one economic activity in this remote part of Oregon and generates \$67 million in economic activity annually for this town of 14,000 residents. It should be noted that our Governors request for Presidential Declaration of this disaster was approved and signed by the President in four days. FEMA responded with personnel and expertise within 24 hours of the incident. In short, the federal response to this disaster was magnificent!

As we reviewed the activities of this event we concluded that we were fortunate that the tsunami inundation was far smaller than estimated, due in large part to the tide was receding to an extremely low level just as the waves were arriving. This acted as a shock absorber which contributed significantly we believe to the relatively low impact. However, the lessons learned by all jurisdictions are invaluable for our future tsunami response planning.

Many valuable lessons were learned during this tsunami event.

1. The federal tsunami warning system, run by the National Weather Service, worked remarkably well, in spite of early technological and IT issues. The alert products were received accurately and in a timely fashion. However, in our after action review, it was noted that when the West Coast and Alaska Tsunami Warning Center (WCATWC) sends alert products, it also sends premium reports which the counties found cumbersome, and in more than one instance, important information was missed due to the volume of data being forwarded. This could be rectified in future events by streamlining the verbiage in the message products.
2. The National Weather Service provided excellent data and warnings to the state and local governments. A key lesson learned is that the NOAA tone alert radios are an absolute must for public buildings, hospitals, schools and all public lodging facilities. Oregon has emphasized the use of alert radios in our educational efforts in order to create redundancy in distant tsunami warning systems.
3. Most tsunami warning sirens worked. However several of these sirens are old and repair parts are no longer manufactured and some failed. But those sirens were operated manually. Widespread reliance on tsunami warning sirens is misguided and can create a false sense of security in the public. It is vitally important that the public understand that they are active participants in the tsunami warning system. Oregon's educational efforts have focused on this personal responsibility in creating a culture of awareness. These tsunami warning systems will be unreliable in the event of a locally-generated Cascadia Subduction Zone earthquake and tsunami.
4. Local law enforcement, along with volunteer fire fighters and Community Emergency Response Teams (CERT) in most cases, effectively conducted evacuations within the forecasted inundation zone. Shelters were established and generally worked well.
5. In some instances, churches and other well-meaning people stood up shelters. Unfortunately, these self-activated centers did not report to local emergency management officers and loved ones were stressed in attempts to locate mostly elderly family members. More training is needed so that sheltering can happen in a more orderly manner.
6. One trend that was observed was that some decision makers did not fully understand the hazard posed by a distant tsunami. In one instance, a small school district superintendent did not take the risk seriously and refused to cancel school. Reports indicate that grade school children were waiting on a dock for the school bus pick-up in a known and documented inundation zone about 30 minutes past the predicted tsunami's arrival. As we now know, the significant wave that struck Brookings did not occur until 3 hours past the prediction of initial wave arrival time. This decision could have been catastrophic.
7. Situational awareness between counties and the state office of OEM needs improvement. County Sheriffs were hampered in communication with adjoining jurisdictions particularly across state lines in Crescent City, California. Oregon is working a pilot project with DHS, Washington, Idaho, Alaska & Montana to create a North West version of virtual USA. Presently we have developed a web based system in Multnomah County that has great potential for local Emergency Managers. Unfortunately, we are funding this from already scarce resources, thus its progress is slow. Had this web based system been employed in our coastal counties, the situational awareness would have been much better.
8. Additionally, the state Emergency Coordination Center will develop a more resilient information system and push information received from one county to all others.
9. Critical information was broadcast on local radio stations in an effective and timely manner. The locally owned stations provided an invaluable service to the public at large and have an excellent

working relationship with local Emergency Managers. One problem discovered in Tillamook County was the lack of information being put out to public in Spanish language. This was noted and will be fixed.

10. FCC digital EAS policies need to be reconsidered. The existing policies mandate the public broadcast messages must be received (digitally) by the radio or TV station. However, states struggle to find the funding to purchase the equipment and develop the procedures to send the message.

11. Another noted phenomenon was that the Hispanic community self-evacuated almost to a person. How they received the information is unclear, but no Hispanic children were in school the day after the event, and employers reported very few Hispanic workers come to work the day of the event. What network they have informally established is unclear, but we are looking into it as something we may emulate. Translation of public education materials into foreign languages is extremely important in making sure that all of our citizenry are safe during tsunami events.

12. Reverse 911 was used, but reports indicate that it was not 100% successful. Lack of telephone switching capacity appears to be the issue and needs to be resolved. This again refers to a lack of financial resources in communities most likely to be impacted by damaging tsunami events. Reverse 911 plays a vital role in providing redundancy in tsunami warning systems, and where it worked well, it greatly aided in a positive action by the public.

This event was an excellent no-notice full-scale exercise. Our systems were tested, and in some instances, failed. Federal state and local, first responders and emergency managers gained tremendous experience with the benefit of a minimal impact to our citizens. Even though one coastal community suffered a serious economic blow, by and large we on the West Coast dodged a bullet!!! The real question now is, are we smart enough to take the lessons learned and improve our systems so we can save lives and recover from a catastrophic event that will happen.

Local tsunami hazard from the Cascadia Subduction Zone

The Cascadia Subduction Zone runs just off our coast and is capable of producing mega-thrust earthquakes similar in size and scope of the 2004 Indonesian and 2011 Japanese earthquake and tsunami.

In some areas, the western edge of the fault is less than 75 miles off of the Oregon coast and slants at a 45 degree angle eastward bringing it under the main continental shelf. The ground shaking from estimated mega-thrust earthquake will be felt from northern California to British Columbia, from the coast to well past the Cascade Range of mountains.

The reaction time from the time of the predicted 8 to 9 magnitude earthquake and ensuing tsunami could be as few as 6 to 7 min, up to 15 to 20 min before a potential 60 foot (or higher) tsunami strikes our coastal communities. We also predict that most, if not all tsunami warning sirens will most likely not be operational due to the significant earthquake. Bridges and roadways will be impassable to vehicles. Communication systems will probably be damaged and probably not functional. Structures will be demolished and injuries and death are a given.

So what have we learned from the Japan earthquake and tsunami and how do we prepare our citizens to survive the coming catastrophic Cascadia Subduction Zone earthquake and tsunami?

Education is a valuable and ongoing need. The public and decision makers need the tools and knowledge to plan for and respond to a catastrophic earthquake and tsunami. Financial resources are needed to create the culture of awareness that will enable the public to be a full partner in preparedness through emergency kits and plans for safety.

Infrastructure and the built environment need to be robust to weather the extreme ground shaking and liquefaction caused by a catastrophic earthquake. A 2007 study¹ by the Oregon Department of Geology and Mineral Industries (DOGAMI) shows a high percentage of hospitals, schools and emergency responder facilities are at a high or very high susceptibility to collapse in a Cascadia Subduction Zone earthquake. Over 300,000 Oregon school children go to school every day in these risky buildings. Oregon has authorized \$30 million per biennium in bonds to retrofit hospitals, schools, and emergency responder facilities. However, only \$22.5 mil has been obligated to date due to the difficult state economic situation. This has allowed Oregon to retrofit 17 schools out of an estimated 906, and 18 emergency service facilities out of an estimated 223 needed.

¹ DOGAMI (2007) *Statewide Seismic Needs Assessment Using Rapid Visual Screening (RVS)*. DOGAMI Open-File Report O-07-02.

The Portland Metro Area, and the Willamette Valley presents a host of complex problems and challenges. This area of Oregon concentrates over 85% of the state's population. The state's key infrastructure in terms of electric distribution, natural gas and petroleum all terminate and re-distribute from the three county Portland Metro Area. The curtailment of these essential commodities will hamper response and delay recovery which will have significant social economic impacts on the entire state. Increased resources are needed to prepare the public, not just in the coastal regions, but also the highly populated Portland Metro Area which most likely will also be greatly impacted.

The federal agencies, NOAA, USGS, and FEMA, need to continue to fund scientific efforts through state/federal partnerships in order to fully understand the seismic hazard posed by the Cascadia Subduction Zone and to better define the threat. However the vast majority of federal funding has been tied to physical science and at some point it needs to be shifted to preparedness (education, planning, equipment (alarms, etc.).

WHERE DO WE GO FROM HERE?

1. Education of all coastal and inland residents is essential. With the known fact that these citizens may only have 6 or 7 minutes between the Cascadia Subduction Zone earthquake event and a major tsunami, there is no warning system that can be relied on to warn citizens. Educating them to understand that if the ground moves, they must move to high ground immediately. They must not wait for some authority to tell them to evacuate.
2. All residents need to have a 72 hour sustainment kit at a minimum. These kits need to be in multiple locations, such as in cars as well as houses, as buildings may be destroyed.
3. Alternative communication means must be employed by local authorities like HAM radios with back-up power, satellite phones. Most likely land line and cell systems will not be available.
4. Funding needs to be enhanced to support state and local efforts to educate and inform citizens. Over the past two years, the Oregon Office of Emergency Management has received FEMA National Earthquake Hazard Mitigation Program (NEHRP) grant dollars, averaging \$81K a year, for earthquake and tsunami preparedness. The office has one person assigned to cover over 363 miles of coast line and the seventeen counties within the Cascadia Subduction hazard zone. This funding is totally inadequate.
5. Funding needs to be increased to provide essential facilities seismic upgrades so local responders can survive in order to render aide post event.
6. Additional funding is required to further develop the tsunami inundation zone data. This is critical to insure that these areas are identified and known for response by outside agencies.

7. Purchase battery back-up tone alert radios for all coastal residents in or near known inundation zones. This is a small amount of money that could save thousands of lives.

Reauthorization of the TSUNAMI WARNING AND EDUCATION ACT (TWEA)

The State of Oregon strongly recommends the reauthorization of the TSUNAMI WARNING AND EDUCATION ACT (TWEA). This key legislation has created a strong tsunami mitigation program predicated on robust federal/state partnerships.

The State of Oregon recommends strong support for the reauthorization of TWEA and limiting the 27% of the funds authorized under Section 8 to non-federal partners, as was originally intended. Through the National Tsunami Hazard Mitigation Program (NTHMP), strong state/federal partnerships have greatly improved tsunami preparedness and mitigation activities. In Oregon, NTHMP has funded a multi-year educational effort that paid dividends during the recent Japan tsunami when the public knew what to do when the warning was issued, but even more importantly, took proper action. While there is room for improvement, Oregon's coastal residents did remarkably well during the tsunami evacuation because great effort was expended in an NTHMP-funded effort.

Creation of additional Tsunami Warning Centers (TWC)

A 2011 National Academy of Science report² found that the tsunami warning center "mission is critically dependent on technical infrastructure and human capital, both of which the committee assessed to be insufficiently supported." Current funding resources do not allow for the needed robustness in the existing two TWC. The March 11, 2011 Japan earthquake and tsunami event revealed weaknesses in both the IT infrastructure and redundancy capability of the existing tsunami warning centers.

² National Academy of Science, 2011. *Tsunami Warning and Preparedness: An Assessment of the U.S. Tsunami Program and the Nation's Preparedness Efforts*. WA, DC: National Academies Press. Pg. 164.

The creation of additional warning centers may in fact jeopardize the ability of the existing TWCs to provide their required functions since they continue to have issues with IT infrastructure and other systems. Moreover, as identified by the recent NAS report, coordination between the two centers is hardly sufficient and adding additional centers will only seek to increase confusion, both in the public and emergency management. If messaging issued by the centers is not simple and consistent, we risk the public's loss of faith.

The argument of a local Caribbean hazard necessitating an additional warning center situated on Puerto Rico is not viable as a justification. The tsunami warning system is not designed to warn of a locally-sourced tsunami and would not be able to respond quickly enough to provide a timely warning to coastal Caribbean communities. The creation of this third center would draw limited funds away from improving the two existing centers, thereby risking the lives and property of American citizens.

Oregon strongly supports increased funding to the two existing tsunami warning centers to improve infrastructure and redundancy capabilities.

Closing Statement

The Cascadia Subduction Zone is over 100 years beyond its cycle of causing a major 8-9 magnitude earthquake. It's a known major disaster waiting to happen. As a nation we traditionally spend very few dollars to prepare for catastrophic events, but spend tremendous amounts of money to respond &

recover. As we have seen in Japan, one of the most prepared nations in the world with respect to earthquake and tsunami preparation, thousands of lives have been lost. Billions of dollars in infrastructure have been destroyed. Yet, there are numerous examples where buildings that did have seismic fixes are standing and can be used in short order after the quake. These are the choices we have before us. Prepare, or cross our fingers and hope this event happens on someone else's watch.

Thank you for this opportunity to submit written testimony.

Appendix H

Press Office

U.S. Department of Homeland Security

Press Release

May 19, 2011

Contact: DHS Press Office, (202) 282-8010

DHS Press Release: DHS Announces Grant Guidance for Fiscal Year (FY) 2011 Preparedness Grants

WASHINGTON—Secretary of Homeland Security Janet Napolitano today announced the release of FY 2011 grant guidance and application kits for 12 DHS grant programs totaling \$2.1 billion to assist states, urban areas, tribal and territorial governments, non-profit agencies, and the private sector in strengthening our nation’s ability to prevent, protect, respond to and recover from terrorist attacks, major disasters and other emergencies. In FY 2011, DHS grants were reduced by \$780 million from the FY 2010 enacted level, nearly a quarter of FY 2010 DHS grant funding.

“In today’s tight fiscal environment, we are maximizing limited grant dollars by setting clear priorities and focusing on the areas that face the greatest risk,” said Secretary Janet Napolitano. “The FY 2011 homeland security grants are focused on mitigating and responding to the evolving threats we face.”

The grants announced today focus on the highest risk cities that continue to face the most significant threats, while continuing to provide dedicated funding to law enforcement throughout the country to prepare for, prevent and respond to pre-operational activity and other crimes that are precursors or indicators of terrorist activity. The 9/11 Commission recommended that homeland security funds be allocated “based strictly on an assessment of risks and vulnerabilities” to focus limited funding in the highest risk areas.

The grant guidance also incorporates feedback from DHS’ state, local, tribal and territorial and private sector partners and includes specific steps undertaken by DHS to improve the ability of state and local partners to apply for and utilize grant funding.

Preparedness Grant Program Allocations for Fiscal Year 2011:

Homeland Security Grant Program (HSGP)—\$1.2 billion for states or urban areas to build capabilities critical to security. HSGP consists of five programs:

- **State Homeland Security Program (SHSP)**—more than **\$526 million** to support the implementation of state homeland security strategies to build and strengthen preparedness capabilities at all levels. The 9/11 Act requires states to dedicate 25 percent of SHSP appropriated funds to law enforcement terrorism prevention-oriented planning, organization, training, exercise and equipment activities.
- **Urban Areas Security Initiative (UASI)**—more than **\$662 million** to enhance regional preparedness and capabilities in 31 high-threat, high-density areas. In order to focus limited resources to mitigate and respond to evolving threats, the 11 highest risk areas (Tier 1) will be eligible for more than **\$540 million**, while the remaining 20 urban areas, designated Tier II will be eligible for more than **\$121 million**. The 9/11 Act requires states to dedicate 25 percent of UASI appropriated funds to law enforcement terrorism prevention-oriented activities.
- **Operation Stonegarden (OPSG)**—more than **\$54 million** to enhance cooperation and coordination among federal, state, territorial, tribal and local law enforcement agencies to jointly enhance security along the United States land and water borders.
- **Metropolitan Medical Response System Program (MMRS)**—more than **\$34 million**, to enhance and sustain comprehensive regional mass casualty incident response and preparedness capabilities, divided evenly among 124 MMRS jurisdictions.
- **Citizen Corps Program (CCP)**—more than **\$9 million** to engage citizens in community preparedness, planning, mitigation, response and recovery activities.

Tribal Homeland Security Grant Program (THSGP)—\$10 million to eligible tribal applicants to implement preparedness initiatives to help strengthen the nation against risk associated with potential terrorist attacks and other hazards.

Nonprofit Security Grant Program (NSGP)—more than **\$18 million** to support target-hardening activities at non-profit organizations at high risk of a terrorist attack and located within one of the FY2011 UASI-eligible urban areas.

Regional Catastrophic Preparedness Grant Program (RCPGP)—more than **\$14 million** to enhance catastrophic incident preparedness in high-risk, high-consequence urban areas and their surrounding regions and support coordination of regional all-hazard planning for catastrophic events, including the development of plans, protocols and procedures to manage regional planning for terrorist attacks and other catastrophic events.

Transit Security Grant Program—more than **\$200 million** to owners and operators of transit systems (including intracity bus, commuter bus, ferries, and all forms of passenger rail) to protect critical surface transportation and **increase the resilience of transit infrastructure**.

Freight Rail Security Grant Program (FRSGP)—\$10 million to freight railroad carriers and owners and offerors of railroad cars to protect critical surface transportation infrastructure from acts of terrorism and **increase the resilience of the freight rail system**.

Intercity Passenger Rail (Amtrak) Program—more than **\$19 million** to protect critical surface transportation infrastructure and the traveling public from terrorism **and increase the resilience of the Amtrak rail system.**

Intercity Bus Security Grant Program (IBSGP)—more than **\$4 million** to support security measures including plans, facility security upgrades and vehicle and driver protection for fixed-route intercity and charter bus services that serve UASI jurisdictions.

Port Security Grant Program (PSGP)—more than **\$235 million** to help protect critical port infrastructure from terrorism, enhance maritime domain awareness and strengthen risk management capabilities in order to protect against improvised explosive devices and other non-conventional weapons.

Emergency Operations Center (EOC) Grant Program—more than **\$14 million** to support the construction or renovation of Emergency Operations Centers to improve state, local or tribal emergency management and preparedness capabilities to ensure continuity of operations during disasters.

Driver's License Security Grant Program (DLSGP)—more than **\$44 million** to help states and territories improve security of state-issued driver's licenses and identification cards in order to prevent terrorism, reduce fraud and enhance the reliability and accuracy of personal identification documents.

Emergency Management Performance Grants (EMPG) Program—more than **\$329 million** to assist state and local governments in enhancing and sustaining all-hazards emergency management capabilities.

Transit Security Grant Program applications are due no later than July 5, 2011. All other preparedness grant applications are due no later than June 20, 2011. Final submissions must be made through the Non-Disaster Grants (ND Grants) system located at <https://portal.fema.gov>.

Further information on DHS's preparedness grant programs is available at www.dhs.gov and www.fema.gov/grants.

Appendix I

Return on Investment Estimates

In 2005 the Multihazard Mitigation Council under the National Institute of Building Sciences produced a report that demonstrated “a dollar spent on mitigation saves society an average of \$4. The full report can be found at http://www.nibs.org/client/assets/files/mmc/Part1_final.pdf.

CBO did a similar study in 2007 on mitigation actions that resulted in a return on investment of \$3 for every dollar spent. The report can be found at <http://www.cbo.gov/ftpdocs/86xx/doc8653/09-28-Disaster.pdf>

During a Workshop on Building Community-Based Risk Management and Responses to Natural Disasters that was conducted in Bangkok, Thailand, in 2008 it was estimated that every dollar invested in risk reduction can save between two and ten dollars in disaster response and recovery cost. See http://siteresources.worldbank.org/INTSF/Resources/395669-1126194965141/1635383-1207662247174/Karlsson_IFRC.pdf

Gail McGovern, President and CEO, Red Cross, noted “Studies indicate that every dollar spent on prevention saves at least four dollars on emergency response—a wonderful return on your investment.” See <http://www.redcross.org/www-iles/Documents/pdf/international/09ISDreport.pdf>

Retired U.S. Army [Lt. Gen. Russel L. Honoré](#), famed for leading the military response in New Orleans after Katrina, took part in the kickoff, urging people to get kits for themselves and others. Every dollar spent on preparedness, Honoré said, saves \$12 in recovery and rebuilding; “and you might save your life.” <http://blogs.palmbeachpost.com/eyeonthestorm/2011/04/23/group-uses-social-networking-to-push-storm-preparedness/>

"Crediting Preparedness" William G. Raisch - Director & Matt Statler, Ph.D. - Associate Director, International Center for Enterprise Preparedness, New York University, 8/2/2006
A compelling illustration of the impact of organizational preparedness can be found in recent research by FM Global, the major property and casualty insurance firm. The firm acknowledges that business interruption insurance is the last line of defense against business interruption, and that the first and most important step is a holistic risk management program that includes all aspects of the organization. FM Global provides site-specific, scientifically-based loss prevention recommendations as part of its coverage. In the aftermath of last year's hurricanes, FM Global compared the loss history of those of its policyholders which implemented its loss prevention recommendations versus those that still had recommendations to complete. They found that those policyholders that fully implemented the preparedness recommendations had on average 75% to 85% lower dollar losses than those policyholders which did not implement such measures. As to the cost of physical improvements and preparedness, the research indicated a remarkable return on investment. In the case of Hurricane Katrina, across 476 locations with a total of \$42 billion in insured property exposed to the hurricane's impact, FM Global clients collectively spent \$2.3 million to prevent a projected \$480 million in loss, with cost of those improvements averaging only \$7,400 per facility. That equals a 208 to 1 payback - or in other words, for every \$1 spent on targeted preparedness measures, \$208 in resources were

saved in one single event." Link to InterCEP's Case Study:
<http://www.nyu.edu/intercep/events/20061009-256.html>

Symantec 2011 SMB Disaster Preparedness Survey - Global Results - *January 2011*
Not being prepared can have a negative impact:

Disasters can have a significant financial impact on SMBs. Downtime costs SMBs a median of \$12,500 per day. It costs small businesses a median of \$3,000 per day and medium businesses a median of \$23,000 per day.

Outages also have a considerable effect on SMB customers. SMB customers reported that SMB outages cost them \$10,000 per day, and 29 percent said they lost "some" or "a lot of" data as a result of disasters impacting their SMB vendors.

Downtime also causes customers to leave with 54 percent of SMB customer respondents reporting they have switched SMB vendors due to unreliable computing systems, a 12 percent increase compared with last year's survey.

For many SMBs, disasters could also put them out of business. Forty-four percent of SMB customers stated that their SMB vendors have temporarily shut down due to a disaster.
http://www.symantec.com/content/en/us/about/media/pdfs/symc_2011_SMB_DP_Survey_Report_Global.pdf?om_ext_cid=biz_socmed_twitter_facebook_marketwire_linkedin_2011Jan_world_wide_dp_survey

Shenandoah Valley Project Impact: Shenandoah Valley Project Impact is a disaster preparedness and mitigation education program that began through a grant from the Federal Emergency Management Agency. Of all businesses that close down following a disaster, more than 43percent never reopen and an additional 29 percent close for good within two years. Unless you protect your business from natural disasters, you risk losing it all together."- Open For Business by the Institute for Business and Home Safety.
<http://www.cspdc.org/programs/disaster/documents/DisasterGuideForBusinesses.pdf>

Disaster Preparedness SBA

Getting back to business after a disaster depends on preparedness planning done today. Small business owners invest a tremendous amount of time, money and resources to make their ventures successful, and yet, while the importance of emergency planning may seem self-evident, it may get put on the back-burner in the face of more immediate concerns. For small business owners, being prepared can mean staying in business following a disaster. An estimated 25 percent of businesses do not reopen following a major disaster, according to the Institute for Business and Home Safety.
<http://www.sbaonline.sba.gov/services/disasterassistance/disasterpreparedness/index.html>