
Research Compendium:
Review of Relevant Information
Resources

National Infrastructure Advisory Council
Regional Resilience Working Group

Background Document

Version 1

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National Infrastructure Advisory Council Regional Resilience Working Group

Research Compendium

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I. Federal Authorities for Response and Recovery

The NIAC examined existing Federal authorities and frameworks that support resilience below the Federal level.

The **Stafford Act** provides the overarching presidential authority to deliver Federal aid to State and local agencies in declared disaster or emergency areas.

The **National Response Framework (NRF)** and the corresponding **National Incident Management System (NIMS)** provide a comprehensive framework of roles and responsibilities for response to all disaster types, and outline a command structure for responders that enable a unified response. These were established under requirements in **HSPD-5**.

PPD-8 establishes a national preparedness goal and system to develop national policies that guide public- and private-sector preparedness for all threats and hazards. It calls for five National Planning Frameworks, the first of which to be released is the **National Disaster Recovery Framework**.

Robert T. Stafford Disaster Relief and Emergency Assistance Act

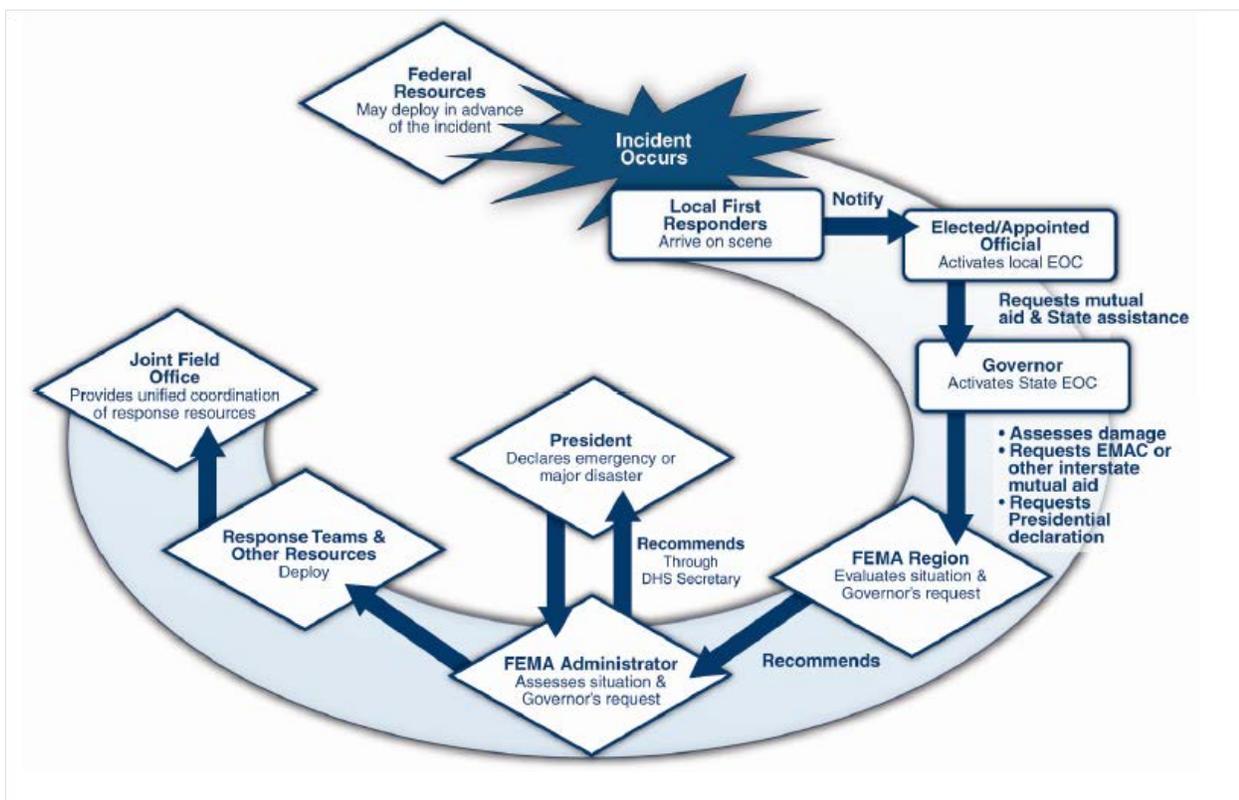
Date: Last amended 2006; enacted 1974

Access: http://www.fema.gov/pdf/about/stafford_act.pdf

Key Purpose: Authorizes the President to issue disaster or emergency declarations in response to catastrophes that overwhelm State and local governments, enabling FEMA to deliver Federal aid to State and local governments, tribal nations, eligible private non-profit organizations, and individuals. It also establishes eligibility requirements for such assistance

Process for Requesting Assistance:

1. Governor determines the recovery is beyond both State and local government resources and requests Federal assistance through FEMA regional office
 - a. Preliminary damage assessment – FEMA assists State emergency management agency, local officials, and the U.S. Small Business Administration (SBA) in evaluating damage and impacts to support a request of assistance
2. FEMA assesses the severity, magnitude, and impact using a set of primary standards, including impact on critical facilities and essential government functions
3. If approved, President can issue a formal declaration authorizing supplemental Federal assistance
4. Federal assistance is deployed through FEMA or other agency



Private Sector Applicability:

Stafford Act permits consideration of private-sector requests for assistance, but does not guarantee that requests will be met in all cases.

- Through the SBA, businesses of *all sizes* within a declared disaster area can apply for a Business Physical Disaster Loan that covers maximum \$2 million for uninsured and underinsured physical damages.
 - Greater assistance may also be provided for economic losses for non-profit organizations.

Key Points on Resilience:

- The Stafford Act provides response and recovery for the public sector for physical disasters, with little focus on cyber events or prevention. It is not designed to help entire sectors recover in a large-scale disaster.
 - Prevention is addressed only by a pre-disaster hazard mitigation program to State/local governments in areas that have been hit in the past with disasters.
- Privately owned organizations—including those that provide critical public services such as electricity—are not eligible for traditional Stafford Act assistance provided to states and cities. They must separately apply for limited SBA loans. This is frequently seen as a gap not addressed by the Act.
- Expanding eligibility to the private sector may be an issue considered by the current Congress, according to the Congressional Research Service.

National Response Framework (NRF)

Date: January 2008

Access: <http://www.fema.gov/national-response-framework>

Key Purpose: Provides a comprehensive, all-hazards framework that enables unified incident response to any disaster from Federal, State, local, and private-sector responders

- Identifies disaster response roles and responsibilities for local, State, and Federal governments, as well as roles for private sector response partners
- Provides extensive roles and responsibilities specific to functional areas—such as Transportation, Energy, etc.—enabling an interoperable structure across all State and local governments; 15 Emergency Support Function (ESF) Annexes outline these roles

- CIKR and Private Sector Support Annexes establish roles for the private sector and a system to coordinate public- and private-sector response and recovery
 - Helps the private sector understand government roles and where within the structure they should partner to aid response
- Provides additional details for response partners to implement the NRF:
 - *Support Annexes*: 8 annexes (including Private Sector and CIKR) that describe essential supporting aspects that are common to all incidents
 - *Incident Annexes*: Address incident-specific response (biological, nuclear, cyber, etc.)
 - *Partner Guides*: Ready references describing key roles and actions for local, tribal, State, Federal, and private-sector response partners

National Incident Management System (NIMS)

Date: December 2008

Access: http://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf

Key Purpose: Establishes standard command and management structures for response activities under the NRF

- Provides a consistent nationwide template that enables all partners to work together to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents
- HSPD-5 requires all Federal departments and agencies to adopt NIMS and use it in their individual incident management programs and in support of all actions taken to assist State, tribal, and local governments

HSPD-5 – Management of Domestic Incidents

Date: February 28, 2003

Access: <http://www.fas.org/irp/offdocs/nspd/hspd-5.html>

Key Purpose: Calls for the establishment of the National Incident Management System and outlines Federal responsibilities for managing domestic incidents in six areas:

1. Incident Management (Secretary of Homeland Security)
2. Law Enforcement (Attorney General)
3. National Defense and Defense Support of Civil Authorities (Secretary of Defense)
4. International Coordination (Secretary of State)
5. Intelligence (Director of National Intelligence)
6. Other Federal Departments and Agencies

Requirements:

- Requires the Secretary of Homeland Security to develop, submit, and administer a National Incident Management System (NIMS) and a National Response Plan (superseded by the NRF)
- Ensures a consistent, nationwide approach for Federal, State, and local governments
- Directs the Secretary of Homeland Security to coordinate with State and local governments and private and nongovernmental sectors to ensure adequate planning, equipment, training, and exercise activities

Key Points on Resilience:

- The NRF and NIMS provide the required structure by which the public sector and private sector respond to disaster incidents.
 - It enables a consistent set of roles and responsibilities and an interoperable command structure across all Federal, State, and local governments.
 - This interoperability supports regional resilience by facilitating cross-State coordination to disaster response.

Presidential Policy Directive - 8 (PPD-8) – National Preparedness

Date: March 30, 2011

Access: <http://www.dhs.gov/presidential-policy-directive-8-national-preparedness>

Key Purpose: Directs the development of a national preparedness goal and national preparedness system to “build and improve 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”

- Aims to facilitate an integrated, all-of-Nation, capabilities-based approach to preparedness
- It is expected to include five National Planning Frameworks:
 - Prevention (drafted)
 - Protection (drafted)
 - Mitigation (drafted)
 - Response (update to 2008 version drafted)
 - Disaster Recovery (released)

National Disaster Recovery Framework (NDRF)

Date: September 2011

Access: <http://www.fema.gov/pdf/recoveryframework/ndrf.pdf>

Key Purpose: As one of the five National Planning Frameworks under PPD-8, it provides a flexible structure that enables disaster recovery managers to operate in a unified way. Where the NRF provides the comprehensive national framework for response, the NDRF provides the comprehensive framework for recovery

- Coexists with the Emergency Support Functions outlined in the NRF and adds Recovery Support Functions in Community Planning and Capacity Building; Economic, Health and Social Services; Housing; Infrastructure Systems; and Natural and Cultural Resources
- Helps identify, coordinate, and deliver Federal assistance needed to supplement recovery efforts
- Coordinates Federal recovery assistance with investments and contributions from the business community, individuals, and voluntary, faith-based and community organizations to accelerate the recovery process

Key Points on Resilience:

- The National Disaster Recovery Framework, the first framework published under PPD-8, demonstrates a strong whole-of-community approach that suggests a higher level of Federal, State, local, and private sector coordination than seen in the past.
- The five National Planning Frameworks required under PPD-8 will expand the national structure for disaster *response* coordination (established in the National Response Framework) to other components of *resilience*: prevention, protection, mitigation, and recovery.

II. Understanding Regional Resilience

The NIAC sought to understand the current state-of-the-art in tools and practices that strengthen regional resilience. To do this, staff examined roadmaps and guides, measurement frameworks, and key resilience studies and how they are implemented in regions within the United States.

Studies, Data, and Resources Examined:

- Roadmaps and processes to *establish and improve* regional resilience
- Processes to *measure and assess* resilience within a region and identify recommendations for improvement
- Studies that examine the *barriers regions are facing* in implementing resilience improvements and what *resources and information they need* to use established models, processes, and metrics to move forward on improving regional resilience

Key findings and recommendations are identified for each of the sources reviewed in this section. However, several common themes are identified in the following text box.

Key Points on Regional Resilience:

- Communities needed step-by-step, “checklist” how-to guides for building community resilience.
 - TISP, the CRSI, and ASME-ITI all attempted to address this need using academic research, regional experience, and existing tools to develop comprehensive guides for assessing regional resilience and developing robust action plans to improve it.
 - Regional resilience guides have laid extensive groundwork by defining regional resilience, identifying the fundamental principles of regional resilience, and providing near-, medium-, and long-term recommendations that regions should follow to develop robust, region-specific action plans.
 - Their processes are remarkably similar, and are now being piloted by community organizations. Interviews may tell us more about the success of these models as they are being used. They each follow a version of this process:
 - a. Form a non-profit facilitating organization or coalition to lead resilience efforts.
 - b. Assess current resilience, typically through a baseline assessment followed by an exercise or workshop.
 - c. Develop a strategy for improving resilience and outline roles and responsibilities in an Action Plan.
 - d. Develop an implementation strategy and identify a coalition or organization to lead implementation.
- Infrastructure interdependences are increasingly important such that regional resilience cannot be achieved without engaging *all* stakeholders: State and local government leaders, non-profit community groups, utilities, and private businesses.
 - Community resilience is intricately tied to the resilience of individual businesses and organizations that support the community, and vice versa.
 - Public-private regional coalitions for resilience are essential to drive the process. Yet despite the value, participation can be a hurdle in terms of staff time, workload, and financial support for SLTT governments.
- Resilience improvements require significant capital, yet few models exist to channel Federal resources or shared resources to regional partnerships or organizations.
 - Work is needed to refocus Federal resources toward community resilience activities.
- Many owners and operators have difficulty building the business case for pre-disaster investment in resilience improvements. The economic information needed to perform effective cost-benefit analyses—such as data from past disasters—is often not available. They may also lack the tools to perform a cost-benefit analysis that identifies the most cost-effective investments.
- There is no standard way to measure regional resilience, though researchers have developed frameworks to define the dimensions that make a community resilient and measure the resilience of particular communities.

2011 Regional Disaster Resilience: A Guide for Developing an Action Plan

By: The Infrastructure Security Partnership (TISP) – This is a member-based, non-profit partnership, which formed after 9/11 to facilitate dialogue on domestic infrastructure security. It consists of 2 million individuals, public agencies, and firms—including trade groups, architecture and construction firms, standards organizations, and economic planners.

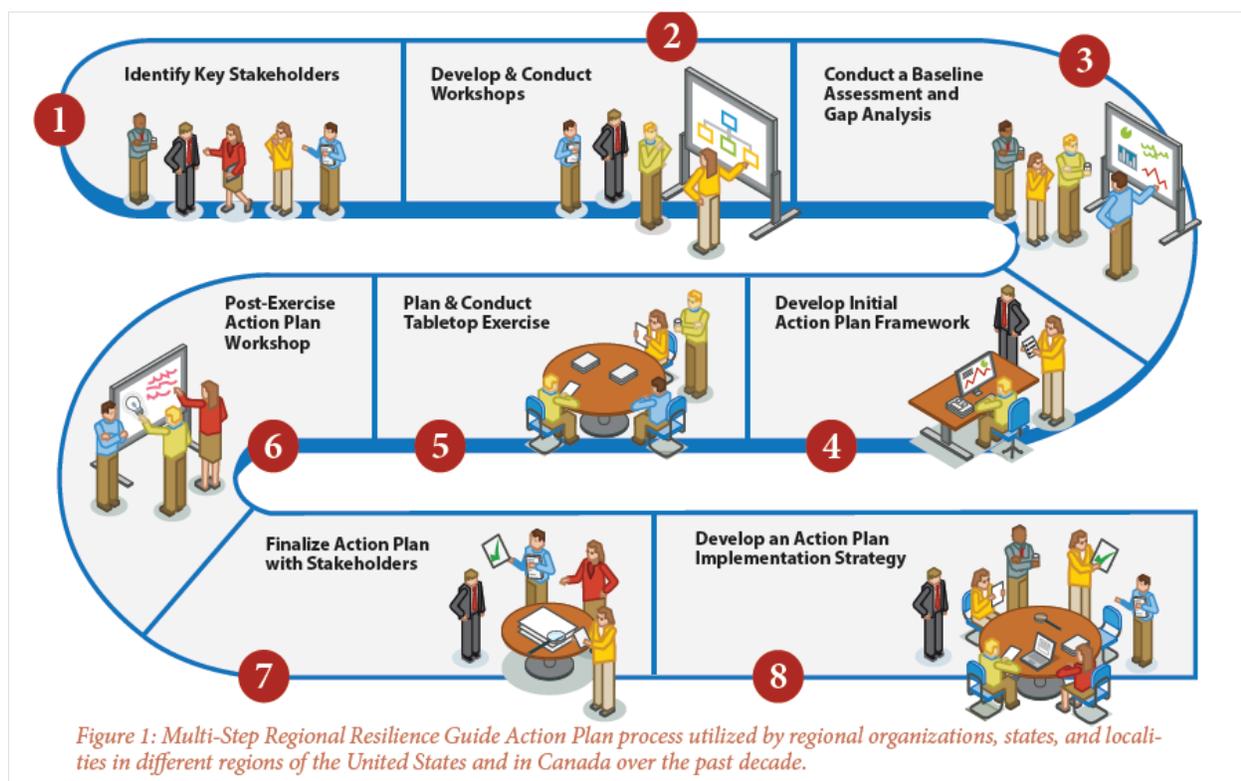
Date: September 2011 Update (originally developed 2006)

Access: [http://www.tisp.org/tisp/file/Template_TISP%20Layout_v29\(2\).pdf](http://www.tisp.org/tisp/file/Template_TISP%20Layout_v29(2).pdf)

Developed by: TISP Regional Infrastructure and Disaster Resilience Task Force that included more than 100 Federal, State, and local government and private sector organizations

Key Purpose:

- Provide a step-by-step “how-to” guide to develop an actionable plan to improve region resilience. Includes:
 - Near, medium, and long-term recommendations—many sector-specific—that regions can follow to develop a robust resilience Action Plan
 - 14 focus areas that cover the disaster lifecycle, and a comprehensive inventory of interdependency needs, gaps, and recommendations in those areas
 - Toolkit (website says coming soon) with action plan templates and assessment tools



Key Points on Regional Resilience:

- TISP offers a collaboratively developed process for improving regional resilience and provides robust, sector-specific recommendations for regions as they set resilience goals. Yet the extent to which regional organizations are successfully implementing this process is unclear.
- The critical first step is establishing a facilitating entity (e.g., regional organizations such as PNWER, AHC) to drive the process. Infrastructure interdependencies require a holistic, all-hazards approach to resilience. As such, resilience efforts must be led by a public-private partnership that includes State and local government; utility providers; critical regional businesses; and non-profit community or social organizations.
 - Buy-in from all stakeholders is essential, but this takes time, commitment, and resources.
- The Federal Government can play a key role in providing technical expertise, seed money, and investment in improvement activities. However, few models exist to provide Federal money to regional entities.
 - TISP is working with federal partners to help them identify current resilience activities that require national-level attention.

Roadmap to Increased Community Resilience

By: Community and Regional Resilience Institute (CARRI). CARRI is a collaborative effort between DHS Science and Technology Directorate, Oak Ridge National Laboratory, and several academic institutions. It is developing a common framework that regions can use to assess and improve their resilience.

Date: August 2011

Access: http://www.resilientus.org/library/CRSI_Final_Report-1_1314792521.pdf

Developed by: Community Resilience Systems Initiative (CSRI) – a 15-month collaborative effort including more than 150 subject matter and process experts who conducted workshops, interviews, and surveys to determine what American communities need to become more resilient

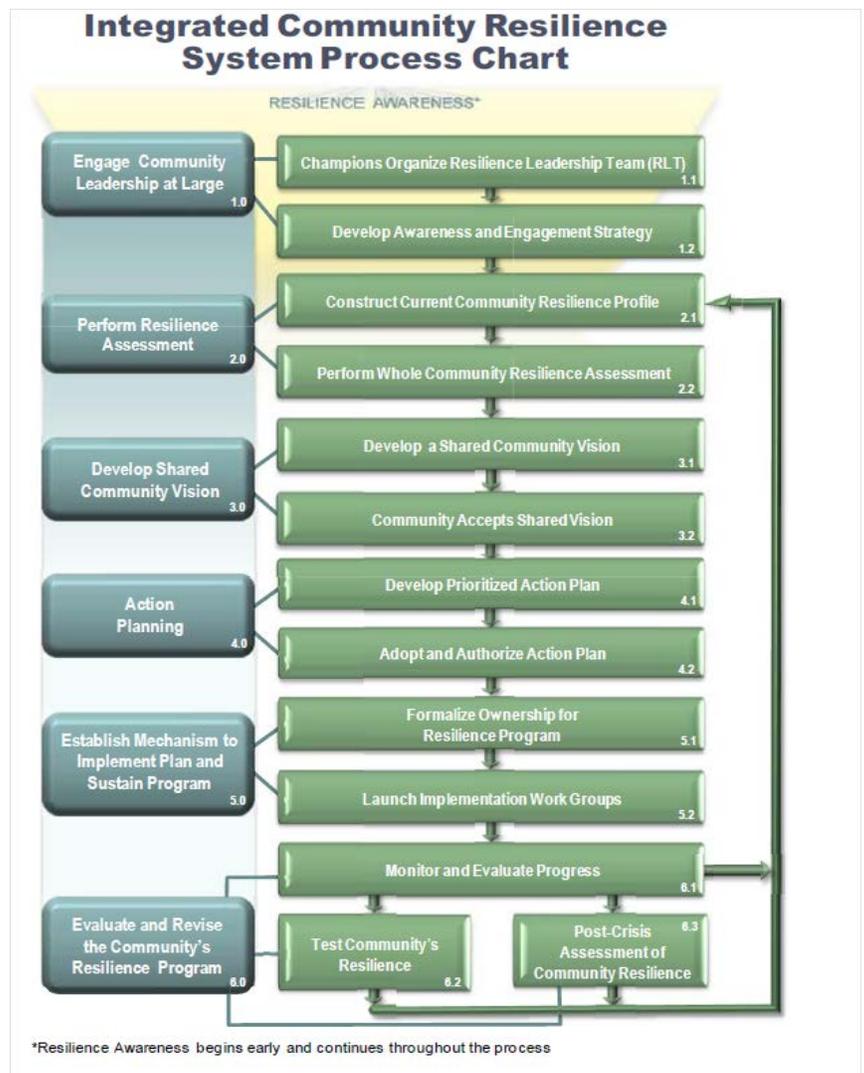
Key Purpose:

- Build the Community Resilience System (CRS), a six-stage process for building resilience that includes templates, checklists, and tools as well as a web-based tracking system to move through the process.

Key Findings:

Communities need the following to become more resilient:

1. Understanding of resilience for their specific community
2. Practical way to measure resilience and project how far they need to go
3. Simple tools and processes to help them move forward
4. Tangible benefits from their efforts



Key Points on Regional Resilience:

- It is critical to build the business case for resilience improvement.
 - Resilience needs to be repositioned as more than mere disaster response—and funding sources for resilience improvements should reflect this. The returns from resilience building are not solely crisis dependent – they accrue on a daily basis.
- There is enormous potential to incentivize communities to improve their resilience without disaster-related benefits.
 - CARRI recommends that organizations like it can work to convene national and local banks, the Treasury Department, the SBA, and the FDIC to reform the process for loan portfolios to accommodate capital needs for disaster preparedness.
 - Organizations can also work with the banking industry to identify new way to introduce pre-disaster capital for small businesses.
- To better support PPD-8, CARRI recommends that Federal agencies redirect existing resources toward community resilience efforts and refocus federal grant and program award criteria to more explicitly support programs that build community resilience.
 - The White House National Security Staff should also create new grant and assistance programs that explicitly support community resilience.
- Community resilience requires local *leaders*. Resilience leadership training should be incorporated into existing national associations (e.g., Chamber of Commerce, League of Cities).
- CARRI recommends that researchers continue to identify tangible benefits that can be linked to implementing the CRS.

A Regional Resilience/Security Analysis Process for the Nation's Critical Infrastructure Systems

By: ASME Innovative Technologies Institute (conducted under a DHS/DOE contract managed by Southeast Region Research Initiative (SERRI) of Oak Ridge National Laboratory). ASME-ITI provides market-relevant engineering and technology-based products to government, industry, and academia.

Date: December 2011

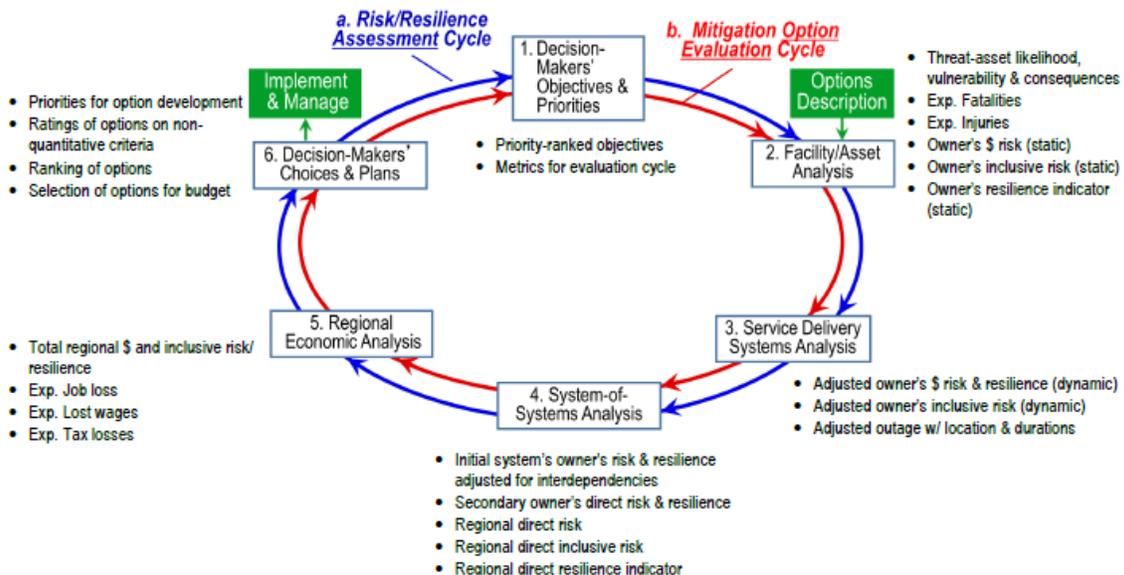
Access: [http://www.serri.org/publications/Documents/ASME%20Project%20-%20Final%20Report%20-%202020%20Dec-2011%20\(Brashear\).pdf](http://www.serri.org/publications/Documents/ASME%20Project%20-%20Final%20Report%20-%202020%20Dec-2011%20(Brashear).pdf)

Key Purpose: Create an objective business process for identifying and evaluating ways for metropolitan regions to enhance their security and resilience within available financial and human resources

Regional Resilience/Security Analysis Process (RR/SAP)

- Risk/Resilience Assessment Cycle—6-step cycle to:
 - Identify the most serious risk and resilience challenges facing the region and its infrastructure, public safety functions, and major industries
 - Set a baseline for comparisons
- Mitigation Options Evaluation Cycle—Identify new projects, programs, and/or investments to enhance the resilience, continuity, security, or other high-priority objectives
 - Define precisely how and how much the programs and investments would improve resilience, security, and the other criteria; what they will cost; and which would be the most valuable to the owners and to the region's citizens

Figure 1.3 Regional Resilience/Security Analysis Process (RR/SAP)



Key Points on Regional Resilience:

- The process provides a quantitative, engineering approach to improving resilience. It is extremely in-depth and provides key features that no other model or process does:
 - Estimates costs from loss/service outages against costs of investment options in terms that are comparable across sites and sectors
 - Incorporates the likelihood of disasters into loss/outage estimates
 - Recognizes that resilience investments are competing with other *unrelated* investment options—estimates the benefits and costs of resilience improvements in a way that owners and operators can directly compare them to unrelated investment options
 - Explicitly models and identifies the effects of interdependencies within a region
 - Includes methods to model transportation systems and public safety functions, and estimate aggregate economic impacts and benefits
- Each part of the process has been feasibility tested in four regions and proven practical and reliable. However, it is not yet a fully developed and integrated tool, ready to be disseminated.
 - Each phase requires additional development and field-testing.
- The process was designed to be carried out by onsite, non-specialized, non-expert staff. However, it appears that the prototype is still far from becoming a non-expert tool.
- When available, and if it can be made into a practical tool, the RR/SAP could be a gamechanger for regional resilience assessment and action planning. ASME-ITI believes it could provide the basis for a national program to enhance resilience through grants, loans and loan guarantees.

Critical Infrastructure Resilience: The Evolution of Policy and Programs and Issues for Congress

By: Congressional Research Service, which provides policy and legal analysis to Congress

Date: Aug. 23, 2012

Access: <http://www.fas.org/sgp/crs/homesecc/R42683.pdf>

Key Purpose: Review policy and program changes incorporating resilience concepts that can aid Congress in its oversight of DHS critical infrastructure programs

Key Findings:

- Policy has evolved since 2006 to the point that *resilience* and *protection* are distinct options to reduce risks—and resilience is considered more robust.
- Government *programs* (such as IP risk assessments) have somewhat evolved to match new *policy* focus on resilience.
- Relatively little government support or incentives exist for private-sector resilience or protection measures.
- It is unclear if market incentives are sufficient to drive private-sector resilience investments.
- Resilience-oriented corrective measures, especially longer-term system redesigns, have not gone as far as the NIAC or Homeland Security Advisory Council have recommended.
 - A reluctance to use public funds to reduce risks to privately owned assets may be the cause.

Shifting Focus to Resilience:

The CRS found that owners and operators can make a better case for resilience—measured in the terms of time and effort to restore operations—than protection alone. Asset owners can enhance resilience by:

- Adding redundancy
- Preparing replacement components
- Redesigning products or processes to eliminate vulnerabilities
- Improvising during an event to use the assets at hand (hardest to prepare for)
- Providing priority access to scarce critical resources
- Modeling system operations to enable operators to better understand and make real-time changes

Key Points on Regional Resilience:

CRS believes that the federal government is now talking the right talk by focusing policy and critical infrastructure language on resilience. However, actual programs and resources aimed at the private sector do not yet provide sufficient incentives to the private sector for resilience improvement investments.

- Congress may revisit two programs to determine the need for additional market incentives:
 - Current efforts to measure the extent that private sector firms are adopting resilience measures
 - The voluntary PS-Prep program, which certifies private sector owners that meet preparedness standards

Disaster Resilience: A National Imperative

By: The National Academies/Committee on Science, Engineering, and Public Policy/ Committee on Increasing National Resilience to Hazards and Disasters

Date: 2012

Access: http://www.nap.edu/catalog.php?record_id=13457 (summary available open-source)

Purpose: Examine ways to increase disaster resilience in the U.S. by providing goals, baseline conditions, performance metrics and gaps or obstacles that need to be addressed. Focused on natural disasters, but conclusions can apply to human-induced disasters.

Developed by: A committee of experts who drew on their own experiences, on published information, and on open meetings and field visits in New Orleans and along the Mississippi Gulf Coast; in Cedar Rapids and Iowa City, Iowa; and in Southern California.

Key Recommendations:

1. **A national resource of disaster-related data should be established that documents injuries, loss of life, property loss, and impacts on economic activity.** Information on disaster losses and potential losses provides the info needed for cost-benefit analyses that justify investments.
2. **The public and private sectors in a community should work cooperatively to encourage commitment to and investment in a risk management strategy that includes complementary structural and nonstructural risk-reduction and risk-spreading measures or tools.** Develop a diverse portfolio of risk management tools for community leaders.
3. **Federal, State, and local governments should support the creation and maintenance of broad-based community resilience coalitions at local and regional levels.** Broad-based public-private coalitions provide a way to unify all parts of a community around the goals of resilience.
4. **Federal Government agencies should incorporate national resilience as an organizing principle to inform and guide the mission and actions of the Federal Government and the programs it supports at all levels.** Currently, the Federal Government lacks an overall vision and coordinating strategy for resilience.
5. **All Federal agencies should ensure they are promoting and coordinating national resilience in their programs and policies. A resilience policy review and self-assessment within agencies and strong communication among agencies are keys to achieving this kind of coordination.** Examine how each agency advances resilience.
6. **The Department of Homeland Security—in conjunction with other Federal agencies, State and local partners, and professional groups—should develop a National Resilience Scorecard.** It is difficult to measure resilience, progress toward it, or perform cost-benefit analyses, without a consistent basis for measuring resilience.

Key Points on Regional Resilience:

- Regions require consistent tools to measure resilience and perform a cost-benefit analysis for needed resilience improvements.
 - The economic information needed to perform informed cost-benefit analyses is not available. Regions and businesses have not been able to learn from the economic losses of past disasters.
- Public-private regional coalitions for resilience are essential to approaching resilience from a holistic perspective.
- Resilience should be an organizing principle for the Federal Government. Programs across the government should be able to clearly define how they contribute to resilience.
- Disaster resilience, including regional resilience, is now receiving the highest level of attention in the Federal Government and its advisory bodies.

Priorities for America's Preparedness: Best Practices from the Private Sector

By: U.S. Resilience Project — A non-profit organization that looks to advance cutting-edge resilience policies, practices, and public-private partnerships by capturing cross-sector business best practices, processes, and tools

Date: October 2011

Access: http://www.usresilienceproject.org/pdfs/USRP_Priorities_Final_020112.pdf

Key Purpose: Brought together public- and private-sector executives for two roundtables to share private sector resilience best practices and examine how they can contribute to national preparedness

Private Sector Principles for National Preparedness:

- *Prepare for Volatility and Constant Crises:* Global enterprises manage multiple major business disruptions in different parts of the world on the same day.
- *Build on Private Sector Best Practices:* Resilience has become a strategic competency and competitive differentiator for American companies. The tools and strategies they developed could contribute to national preparedness.
- *Adopt a Capabilities-Based Approach:* There are an infinite number of potential disruptions and unpredictable “black swan” events. Leading companies instead focus on creating a capacity for resilience—adapt to the unexpected, respond quickly, and mitigate the impacts
- *Manage Globally, Execute Locally:* Give latitude to the professionals on the ground managing the crisis.
- *Create a Framework of Priorities for Response and Recovery:* Clear articulation of goals and priorities prevents stakeholders from working at odds.

Key Findings on Building Public-Private Partnerships:

- *Understand the Core Competencies of the Private and Public Sectors:* Infrastructure owners have the skills and expertise to manage disaster recovery—capabilities the government should leverage. Yet there are issues only the government can resolve.
- *Enable Industry-Led Disaster Partnerships:* Public-private partnerships are often government operations centers that provide a seat for the private sector. Business Emergency Operations Centers (in Louisiana and New Jersey) are industry-led centralized command centers that more effectively deploy private sector capabilities.
- *Identify Risks that Cascade Across Systems and Sectors:* A better understanding of systemic and sector interdependencies will drive cooperation and coordination across the spectrum of preparedness.
- *Capitalize on Private Sector Capabilities:* There are publicly available best practices, toolkits, and capabilities that could be integrated into government disaster preparedness.

- *Practice and Prepare for Partnership:* Create the foundation that enables effective collaboration before a disaster.

Industry executives also identified five priorities for government action that would better enable them to partner during disaster response:

- Establish coherent lines of communication between the public and private sectors.
- Enable access to affected areas, including designated staging areas.
- Provide security as necessary.
- Ensure access to fuel, the transportation network, and energy.
- Remove regulatory and credentialing barriers to movement of people and supplies.

Key Points on Regional Resilience:

- Global businesses face major disruptions daily throughout the world, and they must develop the capacity to manage the outcomes of disruption, regardless of the trigger. Business leaders have been investing in new processes, tools, technologies, and governance structures to support operational risk management, which best addresses growing risk and uncertainty.
- Industry best practices are not well known or well integrated into national response plans. Adopting existing best practices can free up government resources to address gaps that commercial best practices do not and often cannot address.
 - Infrastructure owners have the technical expertise, skilled workforce, and business incentive to manage and recover from disasters. The government should leverage these capabilities rather than attempt to direct them.
 - At the same time, there are issues only the government can resolve. Both public- and private-sector executives need to better understand the core competencies of their counterparts.
- Sector interdependencies create systemic risks that private sector businesses do not own or control. This creates a risk management gap that only the government can fill.
- Industry-led public-private partnerships may provide a better model for leveraging and deploying private sector assets than government operations centers that provide a seat for the private sector.

Landscape of State and Local Government Critical Infrastructure Resilience Activities and Recommendations

By: State, Local, Tribal, and Territorial Government Coordinating Council (SLTTGCC)

Date: May 2011

Access: Contact the SLTTGCC at slttgcc@dhs.gov

Key Purpose: Propose an infrastructure resilience planning model that State and local governments may use to advance regional and community resilience within their jurisdictions. Focus on critical infrastructure resilience as a component of regional resilience.

- SLTTGCC members are using the following model to better integrate their jurisdiction's steady-state critical infrastructure activities and emergency management efforts:
 - Establish cross-sector public-private partnerships focused on the region's key lifeline sectors.
 - Utilize those partnerships to assess each lifeline sector's interdependencies and cascading effects that could influence the sector's recovery time.
 - Employ an exercise or workshop to uncover unknown sector interdependencies and test current levels of preparedness.
 - Address the "outside the fence line" cascading effects on each lifeline sector that would fall to the local or State government to address through its emergency operations plan.

Key Points on Regional Resilience:

- State and local governments have so far focused their critical infrastructure resilience activities on partnership development, response exercises, emergency operations centers, and individual and private-sector readiness campaigns.
- Bridging the disciplines of physical critical infrastructure protection and emergency management is a major challenge going forward.
- The SLTTGCC model for resilience mirrors the more in-depth models reviewed: form a partnership, assess resilience, hold an exercise to reveal gaps, and identify actions for improvement.

Regional Partnerships and the Critical Infrastructure Protection and Resilience Mission

By: State, Local, Tribal, and Territorial Government Coordinating Council (SLTTGCC), Regional Partnership Working Group

Date: May 2011

Access: Contact the SLTTGCC at slttgcc@dhs.gov

Key Purpose: Help SLTT governments assess the value proposition of joining or forming a regional partnership to facilitate critical infrastructure resilience.

Developed by: The working group engaged in a year-long effort to define the value proposition of regional partnerships with four active regional partnerships: All Hazards Consortium (<http://www.ahcusa.org/>); Great Lakes Hazards Coalition (www.theglhc.org); Pittsburgh Regional Business Coalition for Homeland Security (<http://www.pittsburghcoalitionforsecurity.org/>); and the Safeguard Iowa Partnership (<http://www.safeguardiowa.org/>).

Key Findings: Regional organization membership should provide one or more of the following:

- Align critical infrastructure protection and resilience efforts to a region's common hazard or threat environment.
- Achieve a broader and holistic common operating picture of regional critical infrastructure assets and their independencies.
- Identify best practices that can be adopted in a member's own jurisdiction.
- Create new resources and funding opportunities to support regional critical infrastructure activities.
- Leverage expertise and skill sets of coalition members.
- Establish common protocols to govern interactions between owners and operators of critical infrastructure and SLTT governments.

Key Points on Regional Resilience:

- SLTT governments clearly recognize the potential value of joining a regional resilience coalition—the critical first step of any resilience improvement process reviewed.
- Despite its value, membership can be a hurdle in terms of staff time, workload, and financial support. Membership activities must translate into readily identifiable products or improvements that support the government's resilience mission.

DHS IP Regional Focus Groups

Sponsor: DHS Office of Infrastructure Protection (IP) and State homeland security offices

Purpose: Host facilitated sessions to understand owner and operator security and business continuity priorities and how DHS and State government can better support those priorities

Participants: 20-30 owners and operators per Focus Group, representing multiple sectors

Focus Group schedule (by FEMA region):

- Regions I & II: New Hampshire and New Jersey (August 2011)
- Region IV: Alabama, Kentucky, and Florida (February – March 2012)
- Region IX: Arizona and Nevada (May 2012); California (July 2012)
- Region VI: Oklahoma, Texas, and Louisiana (July – August 2012)
- Region VIII: North Dakota, Utah, Montana (TBD)

Key Findings:

- “Regional resilience” is promoted through traditional business continuity, emergency response planning, and public-private partnership activities

Best Practices

- California has incorporated the private sector into full-scale exercises and has established a Business and Utility Operations Center.

Process Improvements

- New Jersey is working with their State-level industry councils to identify the lifeline sector dependencies and restoration requirements that may require governmental assistance to address (e.g., access to restricted areas, road clearing, key worker housing, security, allocation of scarce resources, waivers of regulatory requirements)

Federal Role

- Several Focus Groups have encouraged DHS to continue facilitating sessions that bring together State/local authorities and the private sector to address regional and national resilience challenges, such as access credentialing, mutual aid compacts, and cyber security

Key Points on Regional Resilience:

- Regional Focus Groups indicate that existing DHS IP tools to help regions improve resilience are not widely known nor consistently used by critical infrastructure owners and operators across regions.
 - However, owners and operators do widely rely on Protective Security Advisors for information during disasters.
- Regions are more aware of available IP tools where there are strong public-private partnerships, which serve as a delivery mechanism and force multiplier for available tools.

Conference Board Reports on Preparedness and Resilience

By: The Conference Board, a business membership and research organization that provides economic and business information to improve member performance

4 reports: *Preparedness in the Private Sector* and the *Executive Action Series*: “Achieving Resilience: A Systems Approach,” No. 358; “Achieving Resilience: Planning for Flexibility during Crisis,” No. 361; and “Achieving Resilience: Establishing Networks – Before the Crisis Comes,” No. 362

Date: September 2011

Access: Member-only access to full reports¹

Purpose: Emphasize the relationship between company resilience and community resilience; show recent trends that help CEOs recognize that the resilience of a company depends on the capabilities of the public and private entities that provide it with essential services

Key Conclusions:

Preparedness in the Private Sector

- Based on a survey of 263 private industry executives on how they approach resilience and security, the Conference Board concluded:
 - Few companies have a dedicated unit or function for resilience.
 - To become resilient, a company must develop and perpetuate a culture that values quick response and flexibility and provides authority to local managers to respond rapidly.
 - A company can only assess its level of resilience by assessing the level of resilience of essential elements of the local infrastructure.
 - A company’s ability to recover from a disruption depends inherently on the resilience of its supply chain.
 - Unlike financial risks, there are no widely accepted metrics for resilience.

Executive Action Series

Based on joint workshops conducted between the Conference Board and DHS in Pittsburgh, PA; Raleigh, NC; and St. Louis, MO in 2011

¹ Preparedness in the Private Sector abstract: <http://www.conference-board.org/publications/publicationdetail.cfm?publicationid=2026&subtopicid=30>; Executive Action Series abstracts: No. 358: <http://www.conference-board.org/topics/publicationdetail.cfm?publicationid=2012>; No. 361: <http://www.conference-board.org/publications/publicationdetail.cfm?publicationid=2013>; No. 362: <http://www.conference-board.org/publications/publicationdetail.cfm?publicationid=2014>

- *A Systems Approach.* The public and private sectors realize that it is impossible to protect communities and organizations against crippling events in a vacuum. A new approach is required, one oriented toward complete systems and seeking resilience.
- *Planning for Flexibility during Crisis.* It is impossible to entirely protect against high-impact, low-probability events. Multiple perspectives for planning are now required.
- *Establishing Networks – Before the Crisis Comes.* Because of the complex interdependencies in today's communities, no one organization can achieve resilience as an isolated entity. Community networks and relationships are needed in advance of a crisis.

Key Points on Regional Resilience:

- Company resilience and community resilience are intricately tied. However, one does not achieve the other.
 - As a result, planning cannot be done in a vacuum. A public-private partnership must lead efforts to identify interdependencies and mutual actions to address them.
- An enduring challenge: Companies concerned about their short-term financial performance cannot create a compelling business case for investments to protect against events that may not occur for years, if ever.

UC Berkeley's Regional Capacity Index (RCI)

By: MacArthur Foundation's Research Network on Building Resilient Regions, Dr. Kathryn A. Foster, Director of the University of Buffalo Regional Institute and member of University of California, Berkeley, Institute of Governmental Studies – The Network on Building Resilient Regions brings together experts to examine what constitutes resilience and what factors build and sustain strong metro regions.

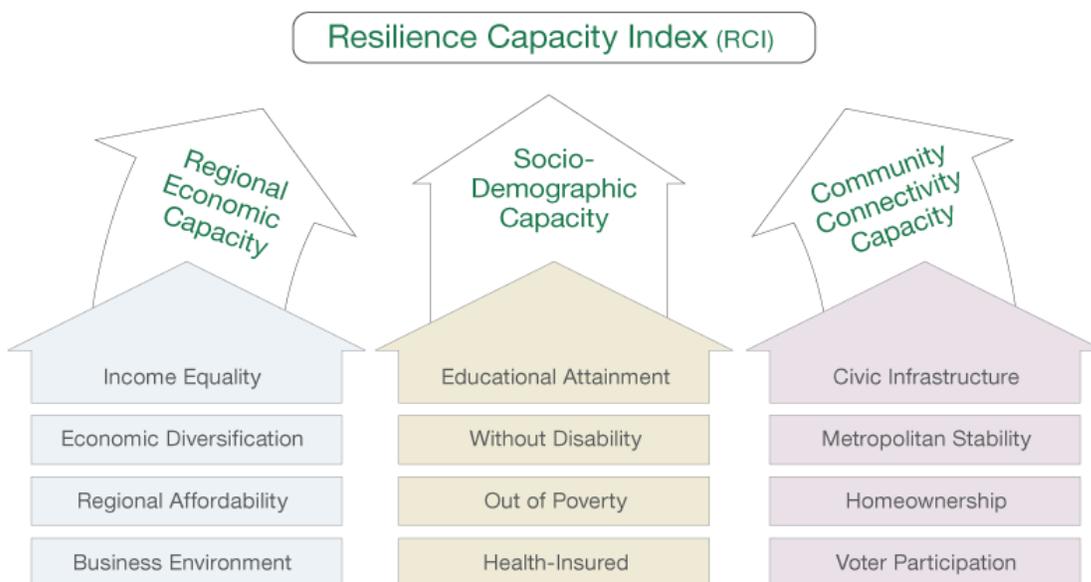
Access: <http://brr.berkeley.edu/rci/>

Purpose: Develop a method to assess a region's resilience by its qualities to cope with future challenges, a concept labeled "resilience capacity."

Key Findings:

Posits the dimensions that determine resilience as 12 equally weighted indicators across three attributes: Regional Economic, Socio-Demographic, Community Connectivity

- These are the indicators—many not typically considered—that researchers hypothesize exemplify qualities needed to cope with future challenges
 - High RCI does not necessarily mean a region will perform well—but that it has the capacity to
- Index does not include geography, specific infrastructure systems, or governance, which are difficult to measure across regions, but which are important factors in regional resilience
- Highly academic; case studies may prove that these are not always reliable indicators



- The Philadelphia metro region ranks very high at 42 out of 361. Washington, DC ranks 10 and New York City ranks 216. Rankings are relative.

Key Points on Regional Resilience:

- This is an attempt to measure a region’s capacity for resilience in a consistent way *relative* to other regions in the United States.
- “Resilience” in their model shows the broad range of social-economic factors—not merely infrastructure—that influence regional resilience. The researchers find these to be important indicators of a region’s ability to withstand disasters.
 - Specific infrastructure resilience—which is difficult to measure across regions—was not considered.
- This model emphasizes the *whole of community* approach to regional resilience.
 - A number of factors contribute to regional resilience—lifeline sector resilience is one of many contributing factors during large disasters.
- The capacity indices attempt to begin addressing the question “What makes one region more resilient than another?”
 - Critical infrastructure resilience is a large contributor.
 - Other economic and socio-demographic characteristics may determine the ability of a community to absorb the impacts of infrastructure failures and reduce consequences of a major event.
 - This framework attempts to define and measure all dimensions of resilience.

MCEER (Multidisciplinary Center for Earthquake Engineering Research) Disaster Resilience Framework at the Community Scale

By: MCEER, which comprises a consortium of researchers and industry partners who develop new tools and technologies that equip communities to become more resilient in the face of extreme events

Date: October 2010

Access: http://mceer.buffalo.edu/research/Resilience_Framework/default.asp (abstract available online)

Key Purpose: Establish a holistic framework for defining and measuring disaster resilience for a community at various scales.

Key Findings:

At the community level, disaster resilience is represented by seven dimensions of community functionality—the PEOPLES framework:

- Population and Demographics
- Environmental/Ecosystem
- Organized Governmental Services
- Physical Infrastructure
- Lifestyle and Community Competence
- Economic Development
- Social-Cultural Capital

Key Points on Regional Resilience:

- Like the preceding framework, this framework attempts to define and measure all dimensions of resilience.
- It provides the basis for development of quantitative and qualitative models to continuously measure resilience.

Resilient Communities: Creating a Community of Practice (audio podcast)

By: Thad Allen, Commandant of the USCG (ret) — National Incident Commander for the Deepwater Horizon oil spill, and placed in charge of Hurricane Katrina search-and-rescue and recovery efforts.

Date: Unknown

Length: 10:53

Podcast Access: <http://www.rand.org/multimedia/audio/2011/12/12/creating-community-practice.html>

Key Purpose: Reflect on critical questions that confront the field of community resilience.

Key Points on Regional Resilience:

- The event does not create the pre-conditions. The pre-conditions exist that lower the ability of the community to react, respond, and participate in the recovery.
- A resilient community is resilient in all facets of life. The question is not just “Do you have enough water, medicine, and supplies to last 72 hours?” but instead “Do you have all the building blocks of a civil society?”
 - The fundamental building blocks of a civil society create the same strength in a community as an immune system does in a body.
 - The people in the community must be able to participate in and be compliant with what they are asked to do during response and recovery. The more resilient communities are capable of doing this.
- Building a resilient community should be the goal of all communities, not just those at greatest risk.
- Several actions could make strides toward resilient communities with little investment:
 - Establish strong relationships in advance of an event—this creates resilience no matter what incident occurs.
 - Better incorporate community/regional groups with passion, commitment, and resources (no matter how few) into planning, response, and recovery.
 - They need to be culturally and organizationally woven into the larger response.
 - Incorporate them better into the NIMS and NRF structure and planning.
 - Establish the accepted attributes of a resilient community and make them known. There should be criteria for a resilient community and a benefit for meeting those criteria.
 - A benefit could be a reduced cost-share with the federal government for grants and funding if the community can demonstrate it is prepared.
 - This requires statutory change, but would be a significant incentive for communities to improve resilience.

III. Resilience in the Philadelphia Metro Area

Philadelphia Emergency Preparedness Review Committee Report

By: 45 individuals in State/local government, private sector, academia, and non-profit sector

Date: June 2006

Access: http://www.phila.gov/pdfs/EPRC_Final_Report.pdf

Purpose: Identify gaps in the resilience of the Philadelphia metropolitan area based on accepted standards and best practices and develop recommendations to address those gaps

How Developed: Performed a gap analysis through:

- Comprehensive review of existing documents, agreements and plans as well as in-depth interviews with more than 200 individuals.
- Investigative field trips to New York, Chicago and Washington, D.C. to further identify best practices
- Regional training exercise in response to a hypothetical terrorist attack at the Philadelphia International Airport
- Congressional visits and meetings with former City officials

EPRC 90-Day Progress Report:

A 90-day progress report released in October 2006 provided a brief update on successes achieved. It appears a 180-day progress report may have been prepared, but can no longer be publicly accessed. The unavailability of further planned updates may indicate that the effort lost momentum, or lost resources to continue reporting progress. Interviews with city officials could provide further insight on the progress of the report's more than 200 recommendations.

Access: http://www.phila.gov/pdfs/Philly_report110206.pdf

Key Points on Regional Resilience:

- Though fairly comprehensive, the review did not focus on impacts outside of Philadelphia and involved only personnel within the city.
- Two of the eight recommendations are particularly relevant: Enhance Federal, State, regional and local partnerships; and protect critical infrastructure and promote public-private partnerships.
 - Though a short-term progress report is available, interviews with city officials will be needed to determine the extent to which recommendations have been carried out in the last six years.
- It calls for the creation of an ongoing forum for the region’s highest elected officials and private sector leaders to regularly review strategic emergency preparedness issues and develop coordinated regional resilience approaches.
 - To date, the staff has not found open-source evidence that this forum has been created.
- It notes that the city already participates in regional disaster planning and resource sharing, but should step up this coordination. Critical gaps included lack of a comprehensive evacuation plan into or out of the city, interoperable communications for underground transportation, and interoperable communications among first responders.
 - Update: The 90-day Progress Report indicated that the city had increased its regional coordination:
 - The City developed mutual aid agreements with four surrounding counties, and was working to extend them to 11 surrounding counties (including DE and NJ) and to the city of Baltimore.
 - The Southeastern Pennsylvania Regional Task Force (newly formed in 2006) hosted a Tri-State Conference with 300 preparedness and response executives to address mutual aid, communications, and overall system and equipment interoperability across jurisdictional lines.
 - The city rolled out its Tier 1 Tactical Solution (which provides short-range interoperable communications) to the five surrounding counties.
 - The city adopted the National Incident Management System (NIMS).
- It recognized the need to continue building public-private partnerships in critical sectors to coordinate resilience planning and information sharing.
 - Update: The 90-Day Progress Report indicated the Southeastern PA Regional Task Force held two exercises—an electricity outage exercise with PECO and a major incident exercise with Philadelphia Gas Works—as part of increased public-private partnership building.

City of Philadelphia Natural Hazard Mitigation Plan

By: City of Philadelphia Managing Director’s Office of Emergency Management (MDO-OEM)

Date: March 2012, final draft

Access: <http://oem.readyphiladelphia.org/HazardMitigation>

Purpose: Describes the process for identifying hazards, creating a risk assessment and vulnerability analysis, identifying and prioritizing mitigation strategies, and developing an implementation schedule.

Why Prepared: To meet requirements of Section 322 of the Disaster Mitigation Act (DMA) of 2000, which requires that local governments have a mitigation plan as a condition of receiving federal disaster mitigation funds

Hazard of Concern	Probability of Occurrence	Population Impact	Infrastructure Impact	Economic Impact	Final Hazard Ranking
Extreme Temperature	A	A	A	B	A
Winter Storm	A	B	B	A	A
Flooding	A	C	B	A	A
Windstorm/ Tornado	B	C	A	A	B
Tropical Cyclone	B	C	B	B	B
Earthquake	C	A	A	A	C
Drought	C	B	C	C	C

Key Points on Regional Resilience:

- The plan includes prioritized mitigation actions for each city department to reduce the impacts of these natural disasters.
 - The plan explicitly notes that not all actions will be implemented due to prohibitive costs, scale, or low cost-benefit analysis ratios.
- The plan was prepared to meet grant funding requirements, and is only focused on the city itself.
 - However, it may provide insight into mitigation actions that could improve resilience outside the city limits.