ESTABLISHING MITIGATION AS THE CORNERSTONE FOR COMMUNITY RESILIENCE

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Introduction

Current events as well as research continue to demonstrate the importance of pre-disaster mitigation and the crucial connection between preparing for, responding to, and recovering from disasters. Historically there has been a focus on emergency response and preparedness and limited attention and resources given to holistic risk reduction (e.g. mitigation and long-term recovery). A report recently submitted to Congress by the National Institute of Building Science's Multihazard Mitigation Council (MMC) highlights that "FEMA mitigation grants are cost-effective, often leading to additional non-federally funded mitigation activities, and have the greatest benefits in communities that have institutionalized hazard mitigation programs" (MMC, 2005). The report also points out that for every dollar spent on mitigation society can expect an average savings of $ 4 (MMC, 2005). This is very welcome news as mitigation has always struggled for resources—both financial and human—in the shadow of response and preparedness. Risk reduction or mitigation is often misunderstood, insufficiently funded, and poorly supported at all levels of government. The MMC's report highlights the importance of strong institutional support for mitigation at all levels of government and the high societal payoff for such support.

Disasters occur as a predictable interaction among three broad systems: natural (e.g., rivers systems, geology, forest ecosystems, etc.), the built environment (e.g., cities, buildings, roads, utilities, etc.), and societal (cultural institutions, community organization, business climate, service provision, etc.). A disaster occurs when a hazard impacts the built environment or societal systems and creates adverse conditions within a community. Although it is not always possible to predict exactly when disasters might occur or the extent to which they may affect a community, we can minimize losses from disaster events through deliberate planning and mitigation.

There are three distinct themes this paper covers. The first provides an overview of communities as complex systems and the challenges communities face in providing a sustainable future for their citizens and businesses. The second theme relates to risk reduction and mitigation as part of the disaster cycle. This section provides a brief overview on the continuing challenge of keeping mitigation on the radar of the current emergency management structure and integrating risk reduction concepts and practices into the dynamic and often complex built and social fabric that make up our modern communities. The third theme describes the need for a collaborative systems approach to community resilience and highlights an organizational structure that can assist communities in by providing technical support, resource development/delivery, and training toward approaching disaster risk reduction and mitigation in a more cost-effective, systematic, and sustainable fashion.

Recent Events and the Complexity of Community

> *"Surely, the threat of losing all we have achieved, everything that makes us the vigorous society we are, cannot apply to us! How could it possibly happen to us? We have books, magnificent storehouses of knowledge about our culture; we have pictures, both still and moving, and oceans of other cultural information that every day wash through the Internet, the daily press, scholarly journals, the careful catalogs or museum exhibitions, the reports compiled by government bureaucracies on every subject from judicial decisions to regulations for earthquake-resistant buildings, and, of course, time capsules."*
>
> -Jane Jacobs
> Dark Age Ahead 2004

The global and national disaster events of the last year have more than proven that disasters strain the ability of individuals, communities, states, and the national governments to pay for losses, and the capability of governmental and nonprofit relief agencies to respond. The 2004 and 2005 hurricanes affecting the Florida and Gulf Coast have highlighted what has long been known by researchers that many costs associated with disaster events—including social and economic disruption—are difficult to quantify but have profound, long-term impacts on communities. Many of these impacts happen well before the hurricane makes landfall. We saw this unfold in the Gulf Coast with evacuations that strained transportation systems and brought up issues of equity when the most vulnerable populations did not have the means to evacuate. Disaster events have the ability to weaken and erode the core of any community, its businesses, social establishments, and its population.

The fact is a city's cultural identity and built environment are not immune to catastrophic loss. It has happened before and it is more than plausible that it will happen again. In Jane Jacobs's book Dark Age Ahead she warns us about the ominous signs of decay to the underpinnings of our culture or as she defines them the five pillars of our culture (Jacobs 2004). The pillars she defines in her book include:

- Community and family,
- Higher education,
- Effective practice of science and science-based technology,
- Taxes and governmental powers directly in touch with needs and possibilities, and
- Self-policing by learned professionals (Jacobs, 2004).

It is important to note that she highlights how many of these pillars are so interconnected that it is difficult to divide them into separate segments. The general premise of Jacobs book is that if we don't start looking at our communities holistically and start addressing the erosion of the core pillars the potential for cultural loss is great. "Interlocking problems, intractable spiraling downward and joining with other problems into amalgamated declines, are daunting but not supernatural" (Jacobs, 2004). Past events have shown that disasters have the ability to exacerbate a community's current problems and trends. If we intend to move our communities toward a more disaster resilient and

sustainable future it is within these complex systems that we will need to sow the seeds of risk reduction.

In the past few decades' concepts such as smart growth, safe growth, and sustainable communities have taken root nationally. These concepts provide communities with an ideal toward which they can strive to address the complex problems communities are facing. If we look at the definitions of these two concepts we see that both concepts must address the aspect of disaster if they are to fulfill their ultimate goals. According to Smart Growth America, smart growth is defined according to its outcomes—outcomes that mirror the basic values of most Americans. "Smart growth is growth that helps to achieve these six goals:

1. Neighborhood Livability
2. Better Access, Less Traffic
3. Thriving Cities, Suburbs and Towns
4. Shared Benefits
5. Lower Costs, Lower Taxes
6. Keeping Open Space Open

-Smart Growth America, 2006

The concept of Safe Growth is to build environments that are safe now and into the future. The goal is to promote protecting people, structures and the systems communities are dependant upon to function. The America Planning Association states that the goal of safe growth is:

"*The goal of Safe Growth is to build environments that are safe for current and future generations of people and to protect structures, transportation and utility infrastructure, and the natural environment — including food systems — from damage. Planners and policy makers must consider the sources of risk, such as geologic or weather-related natural hazards, technological hazards that generate pollution or poisons, terror, error, crime, and economic hardship. Planners might intervene to make development safer at many different points. They might affect the degree of risk through:*

- wise location decisions
- influencing policy decisions
- adopting and enforcing appropriate construction design standards and regulations
- providing incentives for compliance
- following procedures that insure participation and accountability
- introducing safety considerations into discussions
- encouraging conservation of land and energy"

- America Planning Association, 2006

The foundation of sustainable development is rooted in the same realm as safe growth and smart growth. To develop sustainable communities is to meet the needs of the present without compromising the future. The Center of Excellence for Sustainable Development defines a sustainable community as:

"*A sustainable community effort consists of a long-term, integrated, systems approach to developing and achieving a healthy community by jointly addressing economic, environmental, and social issues. Fostering a strong sense of community and building partnerships and consensus among key stakeholders are also important elements of such efforts.*"

-Center of Excellence for Sustainable Development, 2006

All three concepts are similar in that they identify the issues a community faces today and establish a vision for long-term future actions that address and/or eliminate those

issues. They are rooted in a systems approach that applies treatments to the community as a whole.

It is clear that communities are designed and dependent on a very complex interrelated network of built and socially constructed systems. These systems are the core that makes a community tick. Disaster events often highlight the fragility of some of these systems. By looking at community risk from a more holistic and systems approach we can better identify a community's resource exposure (e.g. buildings, roads, utilities, social structure and services etc.) sensitivity, which equates the relative importance of the system (e.g. vulnerable populations or economy) and last but not least the community's ability to respond and recover or its resiliency. Based upon this evaluation we can develop strategies for both short-term and long-term mitigation and disaster risk reduction.

The main reason to take a proactive and collaborative systems approach to mitigation and disaster risk reduction is that as regions, states, and cities grow, the government's ability to provide emergency services for disaster will become ever more difficult due to:

- *Growing demand*: Forecasts indicate that population in Southeast, Gulf Coast Southwest, and West Coast of the United States' major metropolitan areas will continue to grow.
- *Competing interests*: Pressure is increasing on limited public sector resources (e.g. education system, health care, and transportation systems etc.) to maintain quality of life, industry growth and protection of the environment.
- *Increasing risk*: Overall exposure to natural hazards is increasing with population migration patterns.
- *Declining assets*: Aging infrastructure presents looming economic and environmental problems.
- *Environmental stress*: The health of our watersheds, wetlands, estuaries and bays is a threat.

The point is that there is much more to disaster resilience than having good emergency response plans, solid engineering requirements, and perfectly defined and detailed evacuation plans. While it is important to have these tools and resources at our disposal, resilience is something that comes from the community as a whole not just one part or department in government.

So knotty are the problems our communities face today (e.g. education, health care, affordable housing, economic, sustainability, etc.) that it is imperative to take a more coordinated, integrated, and collaborative systems approach to seek workable risk reduction solutions. Natural hazards and disasters are not at the forefront of our decision makers' concerns unless a disaster just happened. Therefore, it is we need to find ways to weave risk reduction and mitigation into the existing fabric that defines our communities and broader concepts, such as smart growth, safe growth, and sustainability, if we want them to become more disaster resilient.

A systems approach to risk reduction could offer communities a coordinated support network aimed at building local capacity to address risk reduction in a holistic and

sustainable fashion. This type of collaborative structure would generate mitigation activity that could not be as effectively accomplished by any single group or entity working independently. The systems approach to risk reduction is based upon building local capacity by providing communities with delivery systems for resources, training, and technical support.

The Disaster Cycle

It is important to understand where mitigation fits in the disaster cycle and the challenges the concept has faced in the past. The emergency management profession and FEMA have used the concept of the disaster cycle (Figure 1-1) to describe the phases of a disaster.

Figure 1-1: The Disaster Cycle
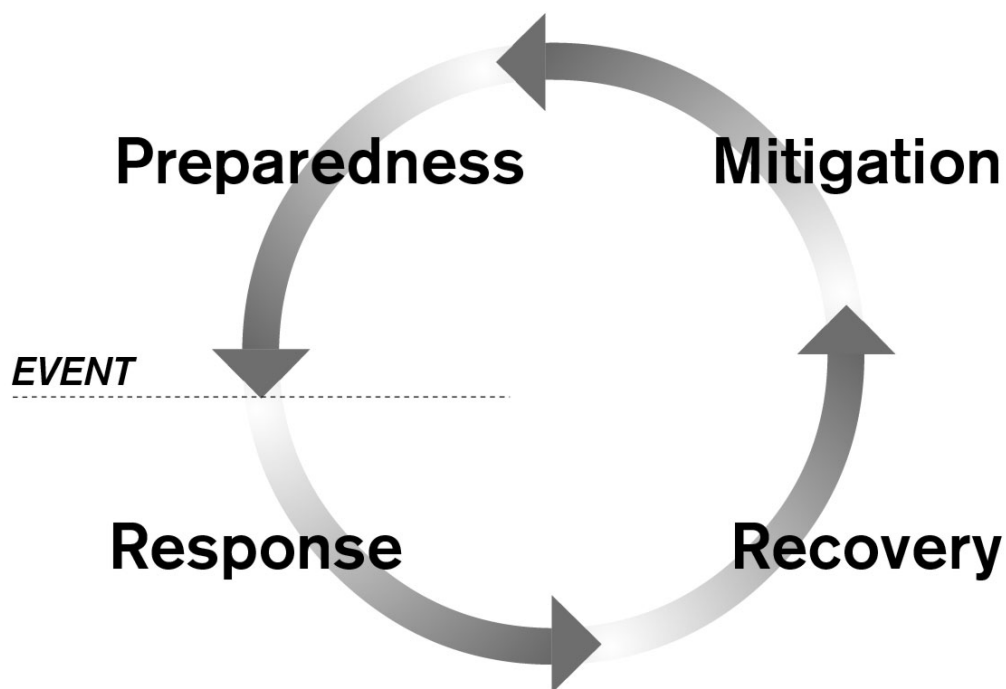
The four phases, Response, Recovery, Preparedness, and Mitigation can be described as follows:

- *Response* begins as soon as a disaster event occurs. Response is the provision of search and rescue, medical services, and access control as well as repairing and restoring communication and data systems during a crisis. A coordinated response plan can help reduce casualties, damage, and decrease recovery time. Examples include emergency operations plans and business continuity plans and established networks of first responders.

- *Recovery* operations provide for basic needs and restore the community. There are two components in the recovery phase. During the first phase, infrastructure is examined, and repairs are conducted to restore water, power, communication and

other utilities. The second phase includes returning to normal functions and addressing future disasters. The process of recovery can take months or possibility years to accomplish depending upon the event. An example would be the development of a post-disaster recovery plan.

– *Preparedness* refers to activities, programs, and systems developed in advance of a disaster designed to build and enhance capabilities at an individual, business, community, state and federal level to support the response to and recovery from disasters. Example strategies might include developing awareness and outreach campaigns and training targeted to individuals and businesses on personal and professional responsibility to be self sufficient for at least 72 hours post-disaster.

– *Mitigation or Risk Reduction* Is the act of reducing or eliminating future loss of life and/or property, and/or injuries resulting from hazards through short and long-term activities. Mitigation strategies may range in scope and size; however, no matter the size, effective mitigation activities have the potential to reduce the vulnerability and/or exposure to risk and impact of disasters. Example mitigation activities for flooding include acquiring, elevating, or relocating structures; for seismic include building code, retrofitting buildings or infrastructure and non-structurally retrofitting labs and offices; and for wind or winter storms include under grounding power lines and tree replacement programs.

In a perfect world the four phases would be given equal attention, integrated, and updated as the community or the risks change. The reality is that with limited funding and competing issues most communities have developed different components (e.g. emergency operations plan and procedures and a mitigation plan) rather than a complete suite of plans, strategies, or a system. The current emphasis on terrorism and demands for response and preparedness planning has further strained many already resource deprived emergency management agencies.

Since fall of 2001, the concept of mitigation has had little to no role in the new Department of Homeland Security structure. If not for the passage of the Disaster Mitigation Act of 2000 and subsequent rules published in 44 CFR Part 201.6 requiring states, communities, and tribal governments to complete natural hazard mitigation plans and provide funding through the Pre-Disaster Mitigation (PDM) Grant Program, mitigation may have been completely removed from the equation. The PDM Grant Program has struggled to survive. This is not due to a lack of need or grass roots support for the program. On the contrary, the PDM grant program has had overwhelming support from states and the professional emergency management community. PDM and the flood mitigation programs are seen as one of the last standing federal pillars for natural hazards mitigation planning and risk reduction. The problem is a lack of federal support both human and financial for the program. This is a drastic change from the late 1990's when mitigation was thought of as the cornerstone concept of emergency management.

Unfortunately, we have not completely learned the danger of taking a single hazard non-integrated approach to emergency management and disaster resilience. A similar set of events transpired during the 1980's at the height of the Cold War when FEMA focused

75 percent of its resources on preparing for a nuclear war (Bullock and Haddow, 2004). In the late 1980's and early 1990's it took a rash of hurricanes (Hugo, Iniki, and Andrew) and a few earthquakes (Loma Prieta and Northridge) to remind us that no matter what external human-causes or threats we may face we can not afford to forget our vulnerability and exposure to natural hazards.

Maybe the recent disaster on the Gulf Coast and the newly published report to Congress titled *Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities* submitted by the National Institute of Building Science's Multihazard Mitigation Council which highlights the benefits and cost effectiveness of mitigation will be enough to turn the tide and elevate the importance of reducing our exposure to natural hazards risk. David Godschalk, a professor emeritus of city and regional planning at the University of North Carolina and member of the Multi-hazard Mitigation Council, published his viewpoint in the November 2004 American Planning Association's magazine Planning stating; "Mitigate, mitigate, mitigate. That's what Katrina teaches us."

Part of the challenge with mitigation is getting people to understand what mitigation is and what mitigation is not. Mitigation activities include all actions taken to reduce or eliminate long-term risk to built and social systems from hazards and their effects; the number of potential activities are numerous and varied (MMC, 2002). Table 1-1, adapted from the July 2002 Multihazard Mitigation Council's report titled, *"Parameters for an Independent Study To Assess the Future Benefits of Hazard Mitigation Activities"* highlights specific examples and types of mitigation projects and activities. Mitigation contrasts with the other short-term disaster phases (e.g. response, recovery, and preparedness) in that it works best when integrated into the community's long-term decision making, operations plans, and implementation strategies. The table highlights that mitigation activities are diverse and multifaceted and diverse nature of mitigation activities and how they cut across nearly every facet of a community with varying levels of responsibility. Mitigation is not just the responsibility of emergency managers or community planners. To accomplish this type of comprehensive mitigation strategy the community must have a vision, plan, and set of actions to accomplish mitigation or risk reduction. It is also essential that the community has someone or some collaborative group that owns the concept of mitigation and will oversee the implementation.

Table 1-1: Various Types of Mitigation Activities

	Type	Types of Activities
I.	Education /Training	Offering workshops and seminars for public officials and employees, personnel of state agencies, and the general public
		Developing video tapes, pamphlets, brochures, and other literature
II.	Commitment and Capacity Building	Organizing community groups and conducting team-building exercises
		Recruiting partners to promote mitigation
		Forming teams or committees for planning and conducting preparedness, response, and recovery planning
		Encouraging interagency cooperation and planning
III.	Risk Assessment, Planning, and Plan Implementation	Conducting hazard, vulnerability, and risk analyses; mapping hazards; preparing inventories of threatened facilities; and carrying out other duties
		Preparing plans (e.g. risk mitigation plans, land improvements plans, harbor management plans, and beach management plans)
		Supporting planning, administrative, and legislative activities
		Forming planning and hazard management districts
		Developing and/or strengthening zoning and building code ordinances
		Enacting new risk mitigation regulations and legislation
		Conducting engineering studies and designing projects
		Developing mitigation incentives such as loan subsidy and/or grant programs
		Providing technical assistance
		Implementing risk mitigation plan
		Coordinating risk mitigation activities
IV	Drainage Projects	Replacing and improving culverts, pipes, mains, storm water lines, drainage ditches, channels, sewer pipes, and backup valves
		Constructing and stabilizing detention ponds and basins, dams, dikes, levees, barriers, berms, floodgates, and flood walls
		Stabilizing riverbanks and shorelines (retaining walls, riprap)
		Dredging and maintaining channels
		Removing debris and vegetation
V.	Acquisition and Relocation Projects	Acquiring, demolishing, and/or relocating structures in flood zones
		Purchasing land and development rights in flood, landslide and erosion zones
VI.	Structural Improvement Projects	Improving and retrofitting buildings and structures to resist earthquakes, wind, hail, water, and waves
		Floodproofing buildings and infrastructure in flood zones
		Elevating building ad other structures
		Installing storm shutters and upgrading roofs to resist wind, rain, hail, and fire
		Constructing hurricane walls, barriers, gates, and tidal valves
		Constructing seawalls, breakwaters, jetties, and riprap
		Constructing new buildings, lifelines, and other structures to meet the appropriate codes
		Repairing damaged buildings in ways to reduce repeated losses
		Constructing and upgrading emergency shelters
		Installing roll-up doors, special windows, and impact-resisting film
VII.	Lifeline Improvement Projects	Upgrading piers and wharves
		Upgrading fuel storage tanks
		Anchoring and bracing equipment
		Improving utilities such as storm water, wastewater, and water treatment facilities and pumping stations; and electric, gas, communications systems
		Improving transportation systems (roads, bridges, etc.)
VIII	Land Improvement Projects	Replenishing beaches
		Stabilizing and restoring sand dunes and roadway banks
		Constructing and/or strengthening bulkheads and head walls
		Managing vegetation
		Controlling erosion (grading and vegetation)
		Stabilizing slopes (grading, drainage and vegetation)
		Remediating soil to reduce liquefaction potential
		Clearing brush, doing controlled burns, and building fuel breaks
Source: Adapted from MMC 2002 and Gottschalk et al. 1999		

The findings in the independent study prepared for FEMA are vital if we are to truly establish mitigation as the one of the four cornerstones of emergency management. As stated earlier the report found that for every dollar spent on mitigation society can expect an average benefit of 4 dollars or higher (MMC, 2005). Additionally, it found two primary conclusions from the recently published report to Congress including:

- *"**Mitigation is sufficiently cost-effective to warrant federal funding on an ongoing basis both before disasters and during post-disasters recovery**. The nation will always be vulnerable to Natural hazards; therefore, it is only prudent to invest in mitigation. In this context, mitigation should be considered in the broadest possible sense to encompass mitigation projects and processes that relate to enforcing strong building codes and land use and zoning measures as well as developing comprehensive plans that will limit disaster-caused damage and promote losses such as disruption of utilities and transportation lifelines."*

- *"**Mitigation is most effective when it is carried out on a comprehensive, community-wide, long-term basis**. Single projects can help, but carrying out a slate of coordinated mitigation activities over time is the best way to ensure that communities will be physically, socially, and economically resilient in coping with future hazard impacts."*(MMC, 2005).

It is time to provide support and incentives for states and communities to establish a more integrated and balanced approach to disaster resilience with mitigation as the cornerstone. If one thinks of the disaster cycle as an equation, then every risk or vulnerability we mitigate today reduces our overall exposure, decreasing the pressure on the response side of the disaster cycle and lowering recovery costs from future events.

Efforts to change community and/or individual behaviors toward managing and reducing risk to natural hazards have proven to be difficult due to lack of awareness and competing interests. Additionally, such efforts are often uncoordinated or under funded, thus reducing the effectiveness of disaster safety messages. That is why it is time to establish an organizational structure that supports a collaborative systems approach to mitigation and risk reduction.

A Collaborative Systems Approach to Community Resilience

Researchers have documented that reducing risk from natural hazards requires integration with various aspects of community planning including (e.g. land use planning, capital improvement, economic development, etc.), better coordination, and more extensive public participation (Burby 1998; Burby 2002; Mileti 1999; Platt 1999). In order for a community to become more resilient it must look at risk as a shared responsibility between government, business, and individuals. All parties have a role and responsibility for risk reduction. Risk reduction and preparedness is not purely the government's responsibility. It takes more time and money to involve a broad and diverse group of stakeholders in the process, but the long-term savings compensates the investment

because the resulting mitigation options are more acceptable (Mileti 1999). Stakeholders range from those making household and business decisions to those who affect the sustainability of an entire community and beyond, such as community planners, local fire marshals, city managers, business owners, conservation club members, realtors, builders, etc.

Additionally, involving a broad base of stakeholders builds partnerships and constituencies that can be very beneficial in the disaster response and recovery phase. The establishment of trusted communication lines and relationships into community social systems (e.g community organizations, church groups, social service providers, and civic groups) prior to a disaster can greatly assist a community in the response and recovery phases of a disaster. In its mitigation guide, the Federal Emergency Management Agency (FEMA) emphasizes that this collaborative approach "goes well beyond the scope of traditional emergency management and touches areas of planning, development, economics, education, critical care, and cultural facilities. The success of this initiative is dependent on the participation of the entire community" (FEMA 2001). This move towards greater collaboration has also been occurring in the fields of natural resource management, public policy and planning (Gray 1989; Wondolleck and Yaffee 2000).

The literature emphasizes that an effective collaboration process requires involvement from a full range of stakeholders, participation from the public who may not be represented by stakeholder interests, and an effective, joint, problem-solving process that leads to agreement about problems and consensus on actions. This holds true for both disaster response planning and pre-disaster mitigation. An example of this was highlighted in a report that evaluated sixty comprehensive plans in Florida and Washington by Burby (2002) which found that "broad stakeholder involvement contributes to both stronger plans and the implementation of proposals in plans." The intended audience for such an endeavor is those who have the authority and accountability to make a difference in natural hazard protection and loss reduction. The message is fairly straight forward, the more stakeholders you have involved the greater the likelihood that the plans, policies and procedures will be a success.

However, establishing a process that involves a broad range of stakeholders and has meaningful outcomes takes time and a considerable amount of organizational structure. This process must not only identify the issues based upon the best available data but must also establish trusted lines of communication and develop feasible solutions with a clear line to implementation. It takes institutional support from all levels of government along with financial and human resources to make this happen. There is no quick and simple technological fix for this problem. It requires people power and good community organizing, facilitation, and coordination skills to establish an integrated systems approach to risk reduction.

A Systems Approach to Mitigation

Since 2000, the Oregon Natural Hazards Workgroup (ONHW) at the University of Oregon's Community Service Center has been leading the development of the Partners for Disaster Resistance & Resilience: Oregon Showcase State Initiative (hereafter referred to as the Partnership). The initiative is modeled after the Institute for Business & Home Safety's (IBHS) Showcase State Program. Implementing and ultimately modifying the IBHS Showcase State model utilized in Rhode Island, has provided Oregon an opportunity to replicate the model in a state where there are dramatically different hazards, geography, politics, and demographics. Oregon's focus on mitigation, through the Partnership is a shift to a systems approach highlighting a more holistic and coordinated statewide risk reduction strategy, thereby providing a more cost-effective approach to reducing disaster loss.

Prior to the Partnership, Oregon made progress toward reducing loss from natural hazards. The state's land use planning laws, building code requirements, emergency preparedness planning, hazards assessment, and other policies and programs laid the groundwork for loss reduction and provided a sound foundation on which to build. However, efforts to change community and individual behavior toward managing risk were not well coordinated or funded, and tended to be a difficult "sell" to local governments, citizens, and business owners, thus limiting the effectiveness of disaster safety messages.

The Partnership and ONHW's systems approach to mitigation offers a model for increased communication, coordination, and collaboration between diverse partners that can be used to increase the capacity of communities to reduce their risk of loss from hazards. The heart of the initiative provides a comprehensive, cost-effective approach for partners – both public and private – to bring together resources – both human and financial – to enhance, develop, and deliver risk reduction resources and training statewide. This was accomplished by establishing statewide communication, coordination, and collaboration among private and public agencies while working with local communities and organizations to determine needs, identify issues, develop resources and 'on the ground projects' to build local capacity for risk reduction. The secondary intent was to develop a model that could be adapted by other states wanting to enhance their own natural hazard mitigation programs.

The Partnership is based upon the concepts identified in the mitigation planning and collaborative process literature highlighted earlier in this paper. The Partnership empowers communities to engage a broad range of organizations—from state and local government, nonprofit organizations, and citizens' groups, to private industry. Consistent with theory, it focuses on audiences who have the authority and accountability to make a difference in natural disaster safety and loss reduction. These individuals and organizations range from those making household and business decisions to those who affect the sustainability of entire communities and beyond.

The mission of the *Partnership* is:

> *To develop and sustain partnerships that offer a
> comprehensive, cost-effective approach for states,
> communities, and organizations to bring together resources –
> both human and financial – to enhance community disaster
> safety and risk reduction statewide.*

The Partnership is organized around a five-year strategic plan developed by ONHW that compartmentalizes the 14 elements of an IBHS Showcase State into five distinct working groups (WG) refer to Figure 1-2: state hazard planning (WG1); business/economic recovery (WG2); pre-disaster mitigation communities (WG3); public awareness/education/outreach (WG4); and public/private partnerships and incentive programs (WG5). Each working group comprises various agencies and private organizations that work to meet the group's goals.

Figure 1-2: *The Partnership's* **Organizational Framework**
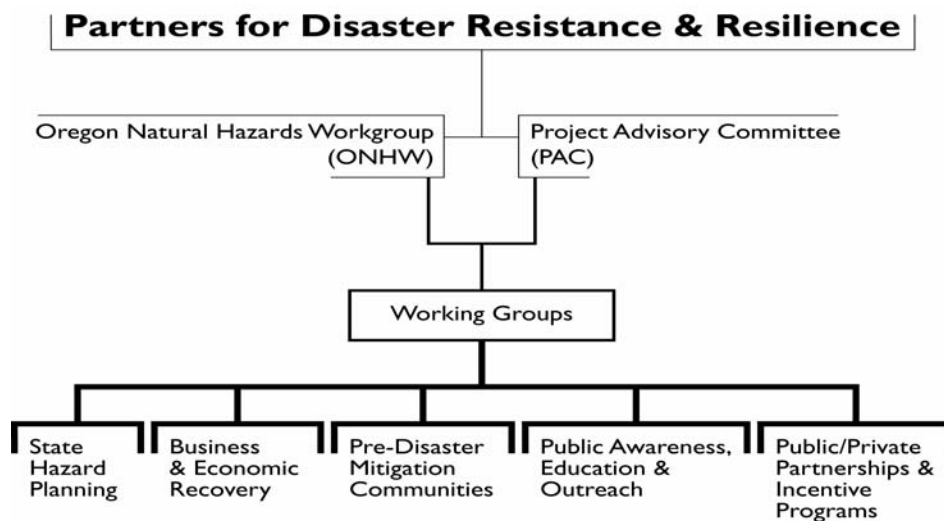
As the literature clearly points out, to have an effective collaboration process you must have involvement from a full range of stakeholders who feel welcome to participate in the process. Therefore, it is paramount to have someone (or organization) serve as the coordinator with the ability to lead and facilitate the process while maintaining a neutral structure that allows for a diverse group of partners. What Oregon has established is a coalition of partners that are united for the common cause of risk reduction and increased statewide disaster safety. The Oregon Natural Hazards Workgroup at the University of Oregon's Community Service Center serves as the lead and coordinating body to unite partners in working to increase natural disaster safety and risk reduction statewide. The Partnership has been able to build on the established and trusted history of the Community Service Center (CSC).

For over 25 years the CSC, an interdisciplinary self funded applied research center at the University of Oregon and its professional staff have continued to provide planning and technical assistance to local and regional entities, to help improve the quality of life in Oregon, and help make Oregon communities more self-reliant, while at the same time affording the highest quality of graduate-level education and professional training to students. The role of the CSC and its programs, such as ONHW are to link the skills, expertise, and innovation of higher education with the natural hazard risk reduction needs of communities and regions in Oregon, thereby providing a service to the state and learning opportunities for students. Through the CSC service-learning model, student participants gain important service and professional experience by helping resolve community and regional natural hazards issues.

The model approaches mitigation and risk reduction from a local community perspective. Understanding that if disaster resilience is to take root, all the pieces of risk reduction, mitigation, and preparedness need to be woven into the existing local decision-making process, plans, policies, and programs. The intent is to offer communities a seamless support network aimed at building their capacity to address risk reduction in a holistic and sustainable fashion. This is accomplished by linking federal and state agencies, professional organizations, resources, and programs directly to communities, individuals, businesses, and organizations engaged in managing complex local risk issues.

The model offers state and federal agencies and representatives a direct line to local communities through outreach, training programs, and plan and project development. This is a great benefit to the local communities as they are able to get first hand guidance from state and federal partners. The Partnership works with such federal partners as the U.S. Department of Homeland Security/FEMA, the US Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), and the U.S Forest Service.

Additionally, the Partnership model has been able to create relationships with national organizations and associations to facilitate the sharing of information in both directions – from communities to the national organizations and vice versa. This has allowed national organizations to better understand local perspectives of the challenges and opportunities regarding risk reduction, while local communities gain access to national resources. Some of the national organizations include: National Emergency Managers Association (NEMA), the American Planning Association (APA), the Association of State Floodplain Managers (ASFPM), the National Firewise Communities USA Program, Small Business Development Centers at the national and regional levels, and the Institute for Business & Home Safety.

The collaborative systems approach focuses on five specific service areas geared to enhance and support mitigation and risk reduction efforts both statewide and at the local level. The following five areas are based upon the Partnership model develop by ONHW:
– **State & Community Needs Assessments:**
  ▪ Identify and evaluate community, regional, and state needs as they relate to social, technical, administrative, political, legal, economic, and environmental

issues and opportunities for risk reduction and mitigation policies, strategies, and programs;

- Leverage limited financial and human resources to support risk reduction and mitigation at the federal, state, and local level.

– **Community Plan Development and Activity Support:**
  - Provide professional technical support (e.g. training programs, workshops, and hands-on assistance) for local Pre-Disaster Mitigation plan development;
  - Place graduate level students with local communities to work for one year building local capacity through community organizing statewide[1]; and
  - Align communities with state and federal partners to address mitigation and risk reduction challenges and develop local solutions (e.g. establish a support network among communities and partners).

– **Training Programs & Capacity Building:**
  - Develop new 'state specific' professional training programs that benefit communities, agencies and partners involved in natural hazard risk reduction based upon needs assessment findings;
  - Deliver existing and implement new training programs that benefit communities, agencies, and partners involved in natural hazard risk reduction (e.g. IBHS's Open for Business Toolkit, FEMA Benefit/Cost Analysis, Pre-Disaster Mitigation Planning series develop by ONHW, and grant writing);
  - Leverage multi-objective programs that bring in resources for environmental protection and enhancement which also provide hazard mitigation benefits (FEMA, USGS, EDA, Firewise, and related funding programs)

– **Technical Resource Development & Applied Research:**
  - Develop, distribute, and provide trainings on new technical resources for mitigation (e.g., Planning for Natural Hazards: Oregon Technical Resource Guide, Natural Hazard Risk Reduction Plan Framework);
  - Develop and distribute statewide hazard event histories and develop regional FEMA HAZUS MH Reports that assist communities in planning and developing site specific natural hazard mitigation projects;
  - Collaborate with public, academic, and private partners to develop and distribute multidisciplinary tools and products aimed at risk reduction;

– **Develop and Maintain the Partnership:**
  - Develop outreach opportunities through professional associations' annual conferences by providing training;
  - Provide information exchange through the Partnerships In Action newsletter and Partnership web site;
  - Facilitate collaboration between agencies by providing networking opportunities at the training programs and outreach at professional conferences;
  - Maintain the Partnership's strategic plan as part of the state's natural hazard mitigation plan.

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[1] This is based upon the University of Oregon's Community Service Centers Resource Assistance for Rural Environments (RARE) program. In Oregon, students have been placed in communities to assist in the coordination and development plans and outreach programs. RARE is part of the Americorp program.

These service areas are coordinated and implemented by ONHW, but relies on partnerships among agencies, communities, and organizations. Activities are organized at three levels: statewide, regional *(or multi-county)*, and local. Each level builds off of the other (e.g., regional activities are based on similar activities at the local level) and leads to a more coordinated and seamless approach to statewide mitigation programs. A success of this model has been in the Community Plan Development Support, Training, and Capacity Building service areas. Since 2002, ONHW has implemented a quarterly plan development workshop series for communities developing hazard mitigation plans. The series includes workshops on: planning process, stakeholder involvement, and public outreach, community asset mapping and risk assessment, development of goals and action items, economic resilience and training on the Institute for Business & Home Safety's Open for Business Toolkit, plan implementation and benefit/cost analysis, grant writing, etc.

Additionally, the systems approach utilized in Oregon makes ensures that mitigation action items are woven into the existing community plans, policies, and initiatives. One of the ways to institutionalize and operationalize mitigation is to make it a part of the tapestry of community oriented planning activities and implementation structures such as:

- o Comprehensive or long range plans,
- o Redevelopment and housing plans,
- o Transportation plans,
- o Economic Development,
- o Capital Improvement Plans,
- o Emergency Operations Plans,
- o Post-Disaster Recovery Plans,
- o Business Continuity Plans,
- o Community Sustainability Initiatives,
- o Etc.

Creating links between mitigation and existing plans, policies, programs, and initiatives presents numerous opportunities for communities to institutionalize risk reduction into the fabric of the community. When done right, a Community Natural Hazards Mitigation Plan can lay the ground work to identify the plans and resources that already exist, and define and integrate action items that can be implemented by a diverse group of community stakeholders. Most of the plans highlighted above already exist and are supported by local residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt easily to changing conditions and needs (Burby, 1998). Implementing natural hazards mitigation action items through existing plans and policies could maximize a community's limited resources. To accomplish this effectively it takes leadership, resources, and a well defined natural hazards mitigation plan.

The collaborative systems approach allows communities and the state to pool technical, financial, and personnel resources, achieving an economy of scale and leveraging of public and private resources that benefits everyone. Establishing an annual quarterly

training series allows for the delivery of critical resources and technical support when the communities are vested in the planning process. This strategy also allows for both vertical and horizontal partnering, communication and coordination. Horizontal partnering refers to county, city, town and district communication, coordination and resource sharing. Vertical refers to federal and state departments. The key to making this collaborative systems approach work is having an organized structure based upon a strategic plan that is implemented by ONHW's staff.

A primary role of this collaborative systems approach is to link the skills, expertise, resources, and innovation of higher education, federal agencies, professional and trade organizations, and state agencies to local risk reduction activities. To date, Oregon's model has built local capacity by providing communities with resources and increased communication and coordination for natural hazards mitigation planning. As of November 2005 seven of Oregon's thirty-six counties had FEMA-approved, locally-adopted Natural Hazard Mitigation Plans, with another twenty-eight in progress. Additionally, cities also have developed and adopted Natural Hazard Mitigation Plans, working with the county in which they are located, often developing the plan through a county-city(ies) partnership. As of December 2005, approximately 30 of Oregon's 240 cities had adopted local, FEMA-approved Natural Hazard Mitigation Plans, with many in progress.

As a result of these planning efforts, Oregon communities submitted 16 project proposals to the Federal Emergency Management Agency's national competitive Pre-Disaster Mitigation program in 2005. Of the proposals submitted, 14 were selected for funding for a total of more than $14.5 million in federal funding for mitigation projects in 2005. Additionally, through the Partnership, ONHW is now leading the largest coordinated and collaborative pre-disaster natural hazard mitigation planning effort in the state. This planning initiative covers more than one-third of the geographic area of Oregon and nearly one-third of its counties.

So what do we need to establishing mitigation as the cornerstone for community resilience?

If our goal is to make disaster resilience a part of every community's routine decision making, thus making communities safer-now and for generations to come —we must provide both human and financial resources to establish the support network needed to assist communities in collaboratively and systematically addressing risk. The seeds of mitigation have been planted through programs like the Pre-Disaster Mitigation program, National Flood Insurance Programs–Community Rating System, Firewise Communities/USA®, etc. We must now nurture and grow these and other risk reduction programs.

It is time to reestablish a comprehensive national mitigation strategy based upon a collaborative systems approach. Mitigation and risk reduction programs like the one defined in this paper continually struggle to find consistent funding support, yet we know that mitigation is most effective when carried out on a comprehensive, community-wide, and sustained basis. We also know that it takes more time and money to involve a broad

and diverse group of stakeholders in the process, but the long-term savings compensates the investment because the resulting mitigation activities are comprehensive in scope.

While it is unrealistic to expect the federal government to fund a mitigation specialist in every community, one potential solution is to provide states with an annual allocation from Pre-Disaster Mitigation funds to establish and support a collaborative system statewide to enhance local capacity for mitigation activities. If we want the roots of mitigation to spread we need to be willing to invest in the concept and establish the organizational structure (e.g. make it someone's job) at the state and local levels. The political and funding support needs to be consistent and dependable in order to facilitate building sustainable state mitigation programs. The numbers are in, proving that benefits of mitigation out weigh the costs as much as four to one. Now is the time to support creative and cost effective programs that can make the changes happen in our communities.

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