

Leveraging Networks to Meet National Goals: FEMA and the Safe Construction Networks

New Ways to Manage Series



William L. Waugh, Jr.
Professor of Public Administration,
Urban Studies, and Political Science
Andrew Young School of Policy Studies
Georgia State University

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F O R E W O R D

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On behalf of The PricewaterhouseCoopers Endowment for The Business of Government, we are pleased to present this report by William L. Waugh, Jr., "Leveraging Networks to Meet National Goals: FEMA and the Safe Construction Networks."

This report is aimed at two audiences. The first one is the Federal Emergency Management Agency community, consisting of FEMA executives, FEMA partners, and FEMA watchers. The report describes how FEMA moved from its historical role of responding to disasters to a more proactive role in mitigating disasters. "Mitigation" is defined by Professor Waugh as "those activities that prevent a disaster from occurring or reduce the likelihood that it will occur, and, if a disaster does occur, reduce its effects." In short, states Waugh, mitigation is about preventing or lessening the effects of disasters. The report describes FEMA activities in fulfilling its National Mitigation Strategy, which was issued in December 1995. The strategy's focus is greater "partnership" between the federal government and state and local governments in achieving the reduction of hazards.

The second audience for this report is much larger. This audience consists of all government executives who have been asked to accomplish national goals, which cannot be accomplished just by implementing specific federal programs or activities. Achieving national goals requires partnerships and cooperation between the various levels of government, as well as between the public, private, and nonprofit sectors. The report describes how FEMA both created parts of a "safe construction" network and "leveraged" that network to work toward accomplishing the national goal of preventing and reducing damage from natural disasters.

We trust that this report will be both helpful and enlightening to both audiences. In the future, more and more government organizations will be asked to reach national goals by creating partnerships and leveraging networks. The FEMA story should be instructive to all government executives seeking to achieve national goals.

Paul Lawrence
Partner, PricewaterhouseCoopers
Co-Chair, Endowment Advisory Board
paul.lawrence@us.pwcglobal.com

Ian Littman
Partner, PricewaterhouseCoopers
Co-Chair, Endowment Advisory Board
ian.littman@us.pwcglobal.com

EXECUTIVE SUMMARY

A series of natural disasters in the 1990s caused hundreds of billions of dollars in damage to homes, businesses, and government facilities in the United States. The costs to homeowners, businesses, insurance companies, mortgage companies, and governments gave impetus to efforts to reduce building vulnerability. In response to the losses, the Federal Emergency Management Agency (FEMA) shifted its focus from disaster recovery to mitigation, preventing or reducing losses rather than simply being reactive and focusing on disaster recovery. Mitigation is one of the agency's three strategic performance goals. A major part of that effort has been activities to encourage safe construction, particularly wiser land-use regulation, stronger building standards and codes, and more disaster-resistant construction methods.

FEMA is working within a national network of public, private, and nonprofit organizations that promote safe construction. The safe construction network is characterized by formal partnerships and informal relationships, much like the networks that are involved in watershed management and rural development. FEMA has limited direct authority in the safe construction policy arena; consequently, the agency has to pursue its performance goals of preventing or reducing property losses through persuasion, bargaining, and coalition building. FEMA's resources do give the agency considerable leverage, but relationships are built more on respect and trust than on authority. The capacity to work within the network is very much different from the agency's experience in hierarchical, formal relationships such as prevail in other policy arenas. Being too aggres-

sive or directive can damage the credibility of the agency within the network. The network creates a synergy and encourages consensus building, unlike more traditional intergovernmental and inter-sector relationships.

FEMA's relationships within the several safe construction networks are varied. The agency has some direct control over land use in communities participating in the National Flood Insurance Program (NFIP), although local priorities may be different from those of NFIP. It has moderate to strong influence, but less control, over the adoption of land-use regulations and building codes within communities participating in Project Impact, because it is the source of technical expertise and financial support. Local Project Impact participants do set their own priorities with some FEMA oversight.

Beyond efforts to encourage safe construction through its own programs, FEMA has considerable influence with organizations like the Blue Sky Foundation of North Carolina, which relies on the agency for funding, and very limited influence over the Institute for Business & Home Safety (IBHS), an organization that represents the insurance industry. The FEMA-IBHS partnership is on more equal footing. Common interests encourage cooperation, but their missions are somewhat different. FEMA is also working with IBHS and the major building standard-setting organizations to develop an integrated code, the International Building Code, and with other organizations that encourage the strengthening of building standards and the development of

safe building methods. Working through these networks demands sensitivity and tremendous investments of time and energy, but the efforts may be the best way to encourage the development of a “culture of mitigation.” Raising building standards and creating a market demand for safe construction will force developers and builders to adopt more disaster-resistant methods.

FEMA’s experience with the safe construction networks does suggest that national goals can be pursued through indirect means but that there may be less control when agencies work through networks. Agencies must be prepared to deal with non-hierarchical relationships, invest time and energy in relationship building, separate regulatory and partnership building functions, be open to participation by organizations and individuals who are not typically included in governmental or even public/private programs, and operate with more transparency than might be expected in traditional programs. However, building trust and interpersonal relationships may be more important than formal agreements and contracts.

Understanding Networks

The transformation of governance in the United States has been characterized by more than a shift of responsibility for public programs from public agencies to institutional arrangements involving public agencies, nonprofit organizations, and private firms. “Third party government”—in which public programs are contracted out to nongovernmental, nonprofit, or private organizations, or privatized—is not the only change in how national policy goals are being pursued. In some policy arenas in which the federal government lacks authority to pursue national policy goals directly, the goals are being pursued through the cultivation of formal “partnerships” and less defined relationships with nongovernmental organizations in areas in which the federal government lacks authority to pursue those goals directly. One of those policy arenas is that involving the encouragement of safe construction in the United States.

The movement for safe construction involves networks of public, private, and nonprofit organizations working individually and in concert through a complex array of formal and informal partnerships, collaborations, and supportive arrangements, as well as through their independent activities. The federal government, through the Federal Emergency Management Agency (FEMA) and other agencies, has some regulatory authority relative to building standards and practices, but primary responsibility for regulating construction lies with state and local governments and the building industry itself. In order for the federal government to encourage safe construction, it must leverage the various networks that are working to strengthen building standards and to encourage the adoption of specific disaster-

resistant construction methods. To reduce property losses from disasters, FEMA has been promoting stronger building standards and codes when it has authority, encouraging the adoption of stronger standards by those with authority, supporting those who are working for the adoption of stronger construction standards, providing assistance in developing stronger standards and safer construction practices, and simply encouraging the efforts of other agencies and individuals who are engaged in activities that further the effort. In essence, FEMA has been working within a complex array of networks by a variety of means to advance the cause of safe construction.

The development of networks in policy arenas is not new. In 1997, Lawrence O’Toole noted the emergence of networks as an important aspect of public administration, and there is increased attention to the unique characteristics of such arrangements. They can have a profound effect on policy making and policy implementation, complicating the processes and the politics. Many of the networks are based on relationships that are hierarchical, such as multiple delivery systems for contracted services. But, many of the networks are based upon more non-hierarchical relationships, and those present unique challenges for public officials and administrators. They may also present unique opportunities. Fragmented authority within the American federal system makes it extremely difficult to accomplish national policy goals when the federal government lacks regulatory authority or cannot offer attractive incentives to encourage compliance. While Congress and the president frequently can provide incentives for compliance,

they cannot easily preempt state and local authority, even when the ends are generally agreed upon. Nonetheless, federal influence has been extended in a number of policy areas through involvement in intergovernmental and public/private “partnerships” and other multi-organizational efforts. Interdependence, shared goals, and strong interest in finding solutions to problems have encouraged collaboration among independent public, non-profit, and private actors.

The Federal Emergency Management Agency (FEMA) is charged with reducing losses because the costs of disaster recovery are rising rapidly for the federal government, and it has found common cause among other public, private, and nonprofit agencies. The insurance industry is concerned about its own exposure to losses, particularly when they could have been prevented or at least limited. The building industry is interested in changes in construction practices to reduce losses as long as the changes do not reduce sales. And, the public supports safer construction and lower insurance costs as long as they do not add too much to the price of homes and businesses. Despite consensus on the seriousness of the problem, state and local governments need incentives to adopt and enforce wiser land-use regulations, stronger building standards, and stronger building codes, and builders and property owners need incentives to implement effective disaster-resistant building practices. FEMA has been leveraging the safe construction networks to achieve those ends.

Intergovernmental and Inter-Sector Networks

The safe construction policy arena is not unique. Increasingly there are policy arenas in which federal or state authorities lack effective authority to control policy decisions. Responsibility for the decisions necessary to achieve the policy goal resides in many hands. Watershed management, for example, is one such arena. Local governments, farmers, commercial fishing interests, recreational interests, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency and its state counterparts, the U.S. Fish and Wildlife Service and its state counterparts, and a variety of other public, nonprofit, and private interests have interests in the use of water and in its quality.

Interdependence encourages cooperation, but does not assure agreement on policy. Even among the government agencies involved, responsibility and authority are diffused. Resolving pollution and other water problems requires consensus, not just majority approval, on remedial actions. Without consensus, levels of cooperation and regulatory compliance are likely to be much lower.

O’Toole described networks as:

structures of interdependence involving multiple organizations or parts thereof, where one unit is not merely the formal subordinate of the others in some larger hierarchical arrangement. The institutional glue congealing networked ties may include authority bonds, exchange relations, and coalitions based upon common interest, all within a single multiunit structure. In networks, administrators cannot be expected to exercise decisive leverage by virtue of their formal position (p. 45).

O’Toole went on to suggest that networks are more common in policy arenas in which issues are complex or ambiguous. The lack of direct control by a government agency encourages network approaches, as does the need to accommodate a variety of programs in a particular policy area. Managers often cannot control those on whom they depend for goal achievement and, therefore, they must bargain in order to meet performance goals. Indeed, as O’Toole concludes, “giving directives may actually weaken influence” (p. 48). Building trust is all important.

Beryl Radin and colleagues found the same sort of arrangement in dealing with rural development. The George H. W. Bush administration in 1990 charged the U.S. Department of Agriculture with creating rural development councils to coordinate the federal and state programs that address such diverse issues as jobs, economic development, and education. The expectation was that the councils would involve federal officials, state officials, local government officials, tribal representatives, and private sector representatives. What developed were networks unique to each state. The fuzzy boundaries of “development” meant that the goals were interpreted differently in each state, approaches

reflected the state-local sociopolitical culture, and a different mix of programs and actors were involved in decision making. Success was dependent upon the effectiveness of interorganizational and interpersonal relations. Mutual dependency encouraged resolution of conflicting goals. Collaborative problem solving became the dominant pattern of interaction. The arrangements were characterized by multiple power centers, overlapping responsibilities, many sources of resources, and a free flow of information. Because of the lack of hierarchical structure, coordination tended to be a problem (Radin et al., 1996: 149-154).

In terms of the structures of networks, Myrna Mandell and Toddi Steelman describe them in the following manner:

A network structure is typified by a broad mission and joint and strategically interdependent action. The structural arrangement takes on broad tasks that reach beyond the simultaneous actions of independently operating organizations. There is strong commitment to overriding goals, and members agree to commit significant resources over a long period of time. There is a high degree of risk involved. Examples of this type of network include a variety of community building efforts and economic development programs (2001: 5).

They go on to suggest that the defining characteristics for the relationships are: 1) the “members’ problem orientation and commitment to goals,” 2) “the intensity of the linkages and the breadth of effort,” and 3) “their complexity of purpose and their scope of effort” (2001: 5).

In short, the nature of the linkages is determined by the extent to which the members share a common perspective on the problem being addressed and are committed to those broader goals, the strength and closeness of the linkages among the members and the openness of the structure to participation, and the complexity of the mission in terms of the need for collaborative problem solving and the scope of the collaboration. Common perspectives on the problem and commitment to its resolution will characterize strong networks. Strong and close relationships among the members, but with an

openness to new participants, and joint processes for problem solving and other actions are also necessary. The networks would not be characterized by a narrow purpose being pursued by a small group of members with limited collaboration in problem solving. Nor would they be characterized by contractual relationships, formal processes of interaction, and limited sharing of resources and information. They are characterized by personal trust, respect, and cooperation. Informal rules are more important than formal ones.

Mandell and Steelman also conclude that the management of networks is different from management in more traditional contexts. It is less oriented to lead agencies and executive control. They suggest that “[b]uilding new management skills in which the role of the manager relies more on communication skills and building areas of trust is seen as a critical strategy of building effective networks” (2001: 17). The interrelationships are complex and messy. Network building, in terms of encouraging participation and commitment and cultivating the relationships, is a critical task. A common history and common organizational culture can help, but there is likely to be considerable diversity in perspectives, motivations, and resources.

The relationships that have to be cultivated and maintained may range from short-term linkages to serve common ends to long-term partnerships based upon broader congruence among organizational goals and objectives. As Myrna Mandell and Robert Agranoff have characterized them, the relationships may be:

- “Linkages or interactive contacts between two or more organizations.
- Intermittent coordination or mutual adjustment of the policies and procedures of two or more organizations to accomplish some objective.
- Ad hoc or temporary task force activity among organizations to accomplish a purpose or purposes.
- Permanent and/or regular coordination between two or more organizations through a formal arrangement (i.e., council, partnership, etc.) to engage in limited activity to achieve a purpose or purposes.

- A coalition where interdependence and strategic actions are taken, but where purposes are narrow in scope and all actions occur within the participant organizations themselves or involve the sequential or simultaneous activity of the participant organizations.
- A collective or network structure where there is broad mission and joint and strategically interdependent action. The structural arrangement takes on broad tasks that reach beyond the simultaneous actions of independently operating organizations (i.e., action may include, but reaches beyond, linkages, coordination, task force or coalitions)" (Mandell, 1999: 5-6).

As the following analysis will demonstrate, the safe construction network involves all of these kinds of relationships. Indeed, multiple networks are in operation (see Agranoff and McGuire, 1999). Consequently, to advance its own goals, FEMA has to navigate among the major actors and encourage momentum in the desired direction. "Management" may be the wrong term to describe the process because it implies hierarchy and at least some control. The agency has to cultivate formal partnerships when possible, informal linkages when agency goals coincide with those of another organization, coalitions when there is mutual agreement on goals and means, temporary linkages when they contribute to goal attainment, and collective action when there is agreement on a broad mission and the efforts of many are needed. It is a complex task environment that requires special skill and patience. FEMA may find it more advantageous to use contractual relationships to advance its agenda, as well (see Milward and Provan, 2000). In essence, FEMA, as well as other actors, may serve as leaders, supporters, catalysts, and cheerleaders with different roles in each network. Turf battles, inflexible procedures and rules, and hierarchy are to be avoided. Support within the organization for external network building is critical because of the time and resource demands on managers (Agranoff and McGuire, 1999: 25-28).

The Safe Construction Networks

At the federal level, the Federal Emergency Management Agency is encouraging safe construction through formal and informal partnerships, collaboration, and the cultivation of relationships

based upon shared responsibility within at least several networks of public, private, and nonprofit organizations. FEMA has developed relationships with building firms. It has encouraged the adoption of stronger building codes through the Disaster Resistant Communities and Project Impact programs. It has also provided support and encouragement to the Blue Sky Foundation of North Carolina, which works with developers and builders, and the Institute for Business & Home Safety (IBHS), which represents the insurance industry, as well as to other organizations of similar purpose. At the same time, public, private, and nonprofit organizations are soliciting FEMA's support for their efforts to generate new standards for building and land use through model home programs, building code integration, research and development on safe construction practices, and other activities.

In some cases FEMA is guiding and coordinating specific programs to create safer construction practices, in some cases FEMA is providing financial resources for efforts directed by other organizations, and in some cases FEMA is simply lending encouragement and offering advice. Within the Project Impact communities themselves, FEMA has some influence because it is providing money and technical expertise. Lacking direct authority over state and local governments and nongovernmental partners, FEMA offered them a stake in the outcome of the mitigation effort (see Daniels and Clark-Daniels, 2001: 53). However, FEMA has had to develop trust in its own intentions, maintain a focus on the common purpose, and, especially, avoid heavy-handed methods to achieve its goals.

The context within which FEMA is operating is a national network involved in the reduction of property losses and human casualties and suffering due to environmental hazards through the adoption of safe construction measures. Prior to Hurricane Hugo, which struck the Carolinas and traveled up the East Coast in 1989, the U.S. insurance industry had suffered no billion-dollar disasters. Since Hugo, the insurance industry has experienced a series of multi-billion-dollar disasters. When Hurricane Andrew crossed Florida in 1992, it left \$30 billion in damage, killed 61 people, and cut a 30-mile swath across the peninsula. Approximately 49,000 homes were left uninhabitable, 180,000 people were homeless, and only nine of the 6,600

mobile homes were left habitable (Morrow, 1997; Waugh, 2000: 78-79). The recovery effort continues after almost 10 years. South Florida had some of the strictest building codes in the nation, but, as Hurricane Andrew demonstrated, communities had very poor code enforcement. Nine insurance companies failed in south Florida following Hurricane Andrew because they were overwhelmed by claims. They had not anticipated the devastation caused by poor construction, and they found themselves with too many policyholders and too little reserves to handle the claims (Kunreuther, 1998: 4-5). Florida suffered heavy property losses again with tropical storm Alberto in 1994 and with back-to-back Hurricanes Erin and Opal. The need to reduce vulnerabilities was manifest, and mitigation became the focus of state disaster policy.

The Northridge, California, earthquake in 1994 caused \$20 billion in damage and killed 57 people. Freeway overpasses collapsed; 112,000 buildings were damaged; and the infrastructure, including water and utility lines, was seriously damaged. Nonetheless, retrofitted overpass supports and homes built after the adoption of newer building codes fared far better than those built earlier (Godschalk, 1999; Waugh, 2000: 69). The Northridge experience reinforced the need to focus on mitigation at the national level. The relatively minor damage done by an earthquake in the Seattle area in 2001 demonstrated the value of mitigation efforts. The prediction by seismologists of a 67 percent chance of a major earthquake in northern California in the next 30 years has given some urgency to the effort to reduce vulnerabilities (FEMA, 1998).

Hurricanes Hugo and Andrew were followed by other super storms, and the Northridge earthquake was only one of a number of major earthquakes during the 1990s. Cycles of super storms and powerful earthquakes are not new, and there is scientific evidence to suggest that more powerful forces will strike the United States in the foreseeable future. Population increases and dense development along the hurricane-prone Gulf and East Coasts and in the earthquake-prone states have put more people and property at risk. It is extremely expensive and getting more expensive to fund disaster recovery, and insurance is not always available to property owners. The economics of disasters provided impetus for

change at the national level. Fortunately, there are ways to reduce the risk and limit the losses. Better construction standards and land-use regulation can significantly reduce losses of life and property. The remarkably low losses from the 2001 earthquake in the Seattle area demonstrated the value of mitigation efforts like Project Impact. The mantra of FEMA in the 1990s was that “one dollar spent on mitigation saves two dollars in recovery.” Mitigation is clearly the cost-effective policy choice.

The Goal: Reducing Property Losses and Protecting Lives

Reducing property losses and protecting human lives from environmental hazards are quintessential government goals, although some might prefer that the financial burden be borne by property owners or others with vested economic interests. The goals are supported by the insurance industry, the mortgage banking industry, the building industry, and the general public. The agreement, however, is in principle rather than practice. While the reduction of risk is accepted as important, people want to live on the beach, in the mountains, next to the river or lake, and in other aesthetically pleasing locales. They choose views or access to water, snow, or woodland, and are willing to pay for them. As a consequence, there is a strong demand for property in hazardous areas, and thus strong pressures for developers and builders to build. Moreover, public officials want to make the developers and property owners happy and they want development to generate tax revenues. It is not that no one cares about the growing risk; rather, it is that so many different individuals and organizations contribute to the problem that it is difficult to stop the process. High-income property owners are too often willing to assume the economic risk of building in



Photo: Leif Skoogfors/FEMA News Photo

This house was torn apart by the flooding of the nearby Clear Fork Creek, W.Va.

hazardous areas, even though such development might increase the risk to other property owners and to the larger community. Low-income residents often have little choice but to live in high-risk areas, such as on floodplains, because the land and housing is less expensive and there may be less concern about their safety.

Flood-prone property, often defined in terms of 100- or 500-year flood risk, may not flood frequently enough to dissuade developers, builders, and property owners from assuming the risk of loss. Or, it may flood frequently after years or decades of

relative quiescence. The risk alone is insufficient to discourage undesirable land uses. Federal, state, and local government officials may not be able to force property owners to reduce risk by moving them to less hazardous environs. While buyouts were the most common mitigation tool in recent major flooding along the Mississippi River, the purchase of flood-prone property has been controversial even when property owners have voluntarily sold or traded their land and buildings. Local officials have not always kept flood-prone property free of development when given the opportunity through buyouts. It has also been legally contentious when property owners have chosen to resist those efforts.

The question is how to regulate such development when there are strong pressures to build in hazardous areas and the federal system prevents, or at least inhibits, effective control over the actors and processes that drive development. Primary responsibility for regulating land use and construction standards lies with local officials. Development is fed by builders and developers, and presumably driven by prospective homeowners and local officials who wish to expand tax bases. How can building and land use be regulated to reduce the risk from environmental hazards? How can mitigation policies and programs be encouraged?

Adopting and enforcing building codes appropriate to the community and encouraging builders and property owners to implement measures to further strengthen structures to withstand wind, flood, and seismic forces would greatly reduce the loss of life and property from environmental hazards. However, new technologies and materials introduce new risks. As the American Institute of Architects concluded in a report on failures of “long span” construction, architects and builders are under pressure to use light materials and exotic designs and to keep costs as low as possible. To reduce costs, little redundancy is built into supports and other systems. Also, it is extremely difficult for general contractors and government inspectors to monitor complex projects with hundreds or even thousands of contractors and subcontractors (Waugh and Hy, 1996: 254-255). Building codes decay over time as builders seek variances to the standards. Local governments have a difficult time enforcing building codes when the salaries of

inspectors are low and there is a lot of turnover in personnel. Maintaining training levels, even with state support, can be difficult. Moreover, in the aftermath of a disaster, there is strong pressure on local officials to issue building permits quickly and with minimal review of building design and materials. There have literally been disasters in which property owners have sought building permits before their burned homes quit smoldering.

Voluntary compliance does not work, according to a 1993 report by FEMA. The report went on to recommend requiring compliance for all property funded or guaranteed directly or indirectly by the federal government, including property financed through loans insured by the Federal Deposit Insurance Corporation. Tax credits, tax-free bonds, and grants might be used to encourage compliance, and noncompliance should negate eligibility for disaster assistance. But, the expectation was that local preferences would prevail. Therefore, selling mitigation is the answer.

Mitigation

Mitigation efforts are those activities that prevent a disaster from occurring or reduce the likelihood that it will occur and, if a disaster does occur, reduce its effects. In short, mitigation strategies prevent or lessen the effects of disasters. Mitigation strategies can be classified as structural or nonstructural. Structural mitigation techniques include building dams, levees, seawalls, and containment ponds to hold water or slow its flow; building storm shelters to protect residents from high winds; and building containment buildings to hold in hazardous materials. Nonstructural mitigation techniques include adopting and enforcing building standards and codes, land-use regulation, zoning ordinances, tax incentives to reduce risk, and public education to encourage risk reduction. Public officials are often predisposed to choose one approach over the other, as evidenced by the reliance on dams and levees along major waterways in the United States, but there is growing support for nonstructural approaches today. Buyouts of flood-prone properties and using natural wetlands to absorb flood waters is preferred over building dams, levees, and seawalls.

Mitigation programs may be voluntary or mandatory. Voluntary programs generally rely on individuals, organizations, and communities to recognize

the dangers posed by hazards and to reduce their exposure to the risk. Public information concerning hazards and how to avoid them and information on safe building practices educate the public, builders and developers, and officials so that they can reduce risk to themselves and to those for whom they are responsible. Reducing taxes or insurance rates for those homeowners who install storm shutters or adopt other risk-reduction measures has also been recommended (Petak, 1998). However, voluntary programs only work if individuals, organizations, and communities decide that the risk outweighs the benefits. Mandatory programs use the threat of punishment to encourage risk reduction. Financial penalties and even criminal prosecution can be used to discourage undesirable behaviors. Nonetheless, some individuals, organizations, and communities may risk punishment rather than change their behaviors. Regulation has been the most common mandatory approach, with punishment for those who do not comply with the regulations, but it is not always easy to follow through with the punishment. For example, studies of floodplain management generally find that people will not limit development on floodplains without strict regulations and the threat of punishment (Cigler, 1996). The punishment for those failing to comply is to withhold disaster assistance following the next flood. However, it is extremely difficult for federal and state officials to deny communities help in the aftermath of disaster and the glare of television lights.

While there is certainly support for mitigation in theory, there is great resistance to regulations that limit the use of private property. The resistance is rooted in American political culture (Waugh, 1990; Waugh and Sylves, 1996). Private property is sacred. Powerful interest groups oppose disaster mitigation programs, such as building codes and land-use regulations, because they put constraints on the use of private property. Developers and builders may oppose stronger standards and safer construction practices even if they are reasonable, because acceptance might encourage more changes. At the same time, professional organizations, such as the International Association of Fire Chiefs, actively promote hazard-reduction regulations and lobby state legislatures and local officials for their adoption. Organizations of professional engineers, architects, and other building experts have actively

lobbied for safer building designs, and professional emergency managers have lobbied for more effective mitigation programs. What is important in terms of the adoption of safe construction measures is that the power of special interest groups tends to be stronger at the local level, rather than at the state or federal level, and control over land-use decisions and building standards is most often local.

Nonetheless, some communities do recognize the need to control development in order to protect lives and property. Indeed, studies of building code adoption indicate that professional groups and individual experts can have a significant influence on local officials' decisions to adopt appropriate codes (see Waugh and Hy, 1996: 257). Educating officials about risk seems to work. Impetus for code adoption, as well as other risk-reduction measures, is also enhanced because local officials can be held personally responsible for failing to address known hazards. While federal and state officials are generally protected from legal liability because of the principle of sovereign immunity, local officials can be held liable for their action or inaction when they are exercising their own discretion. Nonetheless, controlling the behavior of individuals may be difficult for local officials. The courts have not always accepted the necessity of restricting the use of private property even to protect the property owner and the community from hazards. The "takings" issue can be a legal quagmire for officials who wish to reduce the risk to life and property by restricting or preventing development in hazardous areas (see Platt and Dawson, 1999; Waugh, 2000: 175).

While support for mitigation is weak in the absence of a clearly definable risk, major disasters tend to make mitigation a priority. Since the 1989 Loma Prieta earthquake, the city of San Francisco has evaluated its plans and expanded its mitigation programs. The city passed over \$1 billion in bond issues for mitigation programs and integrated its hazard mitigation plan with the city's general plan to guide development and operations (Godschalk et al., 1998: 261-262). There were conflicts with FEMA over local priorities, particularly in terms of retrofitting the city hall to be more earthquake resistant. Local officials prefer discretion in the selection of priorities, and federal officials generally prefer specific kinds of programs that are more easily monitored.

State governments have also implemented mitigation programs. As a condition for receiving federal disaster assistance, states are required to develop mitigation plans and to respond to a list of recommendations developed by an Interagency Hazard Mitigation Team of state and federal experts. Following the 1989 Loma Prieta earthquake, the state of California adopted an earthquake mitigation plan, *California at Risk: Reducing Earthquake Hazards 1992-1996*. The plan outlined priorities, schedules, funding, and specific hazard-reduction initiatives and recommended actions to improve hazard identification and monitoring and to improve the state's land-use planning and regulation, among other things. State funding was provided for hazard analysis and planning. Following the 1994 Northridge earthquake, the state of California's Office of Emergency Services (OES) and FEMA issued their Interagency Hazard Mitigation Team report, which recommended specific mitigation strategies, including compliance with the 1991 Uniform Building Code and additional public education efforts. The state mitigation strategy issued in 1995 outlined priorities including addressing the vulnerabilities of educational and medical facilities, even moving some schools to safer ground (Godschalk et al., 1998: 237-244).

Similarly, the state of Florida implemented mitigation programs following Hurricane Andrew in 1992. Andrew caused \$25 billion to \$30 billion in damage, and the recovery process continues almost 10 years later. Dade County produced a hazard mitigation plan in order to receive disaster assistance. Projects funded under FEMA's Section 404 Hazard Mitigation Grant Program were slowly implemented, some as late as 1996. Many of the projects were for storm shutters and other improvements needed to make buildings more wind resistant. The Interagency Hazard Mitigation Team's report focused primarily on the building codes in south Florida. While the codes were relatively strong, compliance was poor because much of the construction was done by unlicensed contractors; there were too few building inspectors to monitor construction adequately; the building inspection process was ineffective; the structural design and wind standards were poor; the standards for manufactured homes, including mobile homes, were inadequate; and the standards for window design were poor. Local governments

had not adequately monitored construction and enforced building codes. Builders had not regulated themselves as expected. And, residents had not complied with codes when residential structures were renovated (Godschalk et al., 1998: 116-119). There had been strong pressure for development and very little attention to the vulnerability of the structures being built. Relying on voluntary compliance with codes by builders and property owners simply did not work.

In March 1993, the Florida state building code was changed. The new code required the 116 mph national wind speed standard that accommodates gusts and wind pressures; protection, such as shutters, for windows and doors in new homes; review of structural plans by a structural engineer; concrete columns in single-story houses; and more roofing inspections. Miami-Dade County also increased the number of building inspectors from 16 to 43 and roofing inspectors from four to 31 (Godschalk et al., 1998: 120).

The state of Florida established a trust fund to finance recovery and mitigation programs that were not covered by federal funds. Dade County passed a sales tax to generate revenue for recovery and mitigation projects. Also, the state created the Florida Hurricane Catastrophe Fund, which provides reinsurance coverage so that insurance companies would not fail in the next catastrophic storms, and the state Emergency Management Preparedness and Assistance Trust Fund, which places a surcharge on residential and business property insurance policies to fund emergency management, disaster planning, and mitigation projects (Godschalk et al., 1998: 122). FEMA approved Florida's State Mitigation Plan in May 1994. "Immediate priority" was given to mitigation programs for critical systems, the loss of critical infrastructure, shelter strategy, repair and retrofitting structures, protecting the outside envelope of buildings, and intergovernmental mitigation efforts (Godschalk et al., 1998: 150). "Highest priority" was given to standards for manufactured homes and state buildings, building code enforcement, a common building code, local land-use planning, relocation and land acquisition, and the process for issuing building permits (Godschalk et al., 1998: 150).

Unfortunately, while the biggest danger from hurricanes is usually storm surges, most of Florida's mitigation efforts focused on wind resistance. To address the storm surge problem would require greater restrictions on building on and close to the beaches, and there would have been great resistance to such restrictions in south Florida (Godschalk et al., 1998: 135, 146-147). The new Florida Building Code, which went into effect on January 1, 2002, increased wind-resistance requirements and required measures to deal with wind-blown debris. The measures to make windows less vulnerable to flying debris include shutters and impact-resistant glass (Twisdale, 2001).

Clearly, local and state governments can and often do act to reduce the risk of environmental hazards. Major disasters provided needed impetus, including financial support, for the effort. Problems emerge when there are strong political pressures to ignore hazards, too little scientific knowledge about the hazards, and/or too little technical knowledge about how to mitigate the hazards. For example, recent coastal flooding in the Pacific Northwest due to the El Niño phenomenon has revealed the remains of forests buried by giant tsunamis ("harbor waves") caused by earthquakes and landslides off the coast of Washington State and Oregon. Coastal communities are implementing mitigation plans to reduce the likelihood of property damage and the loss of life, as well as implementing warning systems, in preparation for the next large tsunami to hit the coastline (Waugh, 2000: 68, 70).

Building Codes and Safe Construction

States and/or communities may adopt building standards and building codes to ensure residential and commercial structures meet minimum standards. Building standards specify the materials that can be used in the construction of homes, businesses, and institutional structures. The standards are based upon such criteria as strength, durability, flammability, and resistance to water and wind, and the appropriateness of designs for the environment. Building codes are sets of regulations adopted by states and/or communities that specify the kinds of building materials and designs that are appropriate for particular locations. Codes include general stan-

dards to reduce the risk of fire and/or damage from earthquakes or other kinds of disaster and specific measures to reduce the potential damage from wind or other hazards. Building codes set standards for the substructure (below ground), superstructure (above ground), and infrastructure (interior, principally plumbing and electrical systems) of buildings. Codes specify minimum standards for wiring, trusses, beams, and other design and construction details. Codes may differ according to the building use, expected occupancy (including whether special populations—e.g., the disabled or children—may use the building), and other factors. Building codes do not always include fire codes.

There are a number of model building codes that are used in the United States, including the following:

- National Building Code (NBC)
- Uniform Building Code (UBC)
- International Building Code (IBC)
- Southern Building Code (SBC)

Some states have adopted statewide codes and require enforcement by counties and municipalities. According to IBHS, there are no statewide residential building codes in 21 states and no state commercial building codes in five states (as of December 2001). Others recommend that local governments adopt codes or leave it up to local governments to do so or not. Peter J. May (1997) has categorized the orientations of state governments to building regulation as minimalist, enabling, mandatory, and energetic. Minimalist states have no codes or have them only for some situations. Enabling states authorize local governments to adopt and enforce codes, but do not require it. Mandatory states have state codes and require local enforcement, but do not strictly oversee enforcement. Energetic states both require local enforcement of codes and monitor local compliance with that requirement. The orientation to building regulation, according to May, is related to the state's political culture, including the influence of interest groups. May's categorization of the states is detailed in Table 1.

What the data indicate is that half the states do not have statewide building codes and do not require

Table 1: State Groupings for Building Regulation

Categories of States			
Minimalist	Enabling	Mandatory	Energetic
Alabama Arizona Colorado Delaware Hawaii Illinois Kansas Maine Mississippi Missouri New Hampshire North Dakota Oklahoma Pennsylvania South Carolina South Dakota Texas	Arkansas Georgia Idaho Iowa Louisiana Minnesota Nebraska West Virginia	California Florida Indiana Maryland Massachusetts Nevada New Mexico Rhode Island Utah Virginia Washington Wisconsin	Alaska Connecticut Kentucky Michigan Montana New Jersey New York North Carolina Ohio Oregon Tennessee Vermont Wyoming
N=17	N=8	N=12	N=13

Source: May, 1997: 75.

that their communities adopt codes. While some states do require strong codes and require serious enforcement by local authorities, much is left up to local officials. It is not just a case of needing to encourage state officials to make appropriate building standards and codes mandatory and forcing communities to adopt and enforce the codes. The responsibility for land-use decisions and related issues, such as building standards and zoning, often resides at the community level based on constitutional provision, rather than by statutes that are more easily changed. Residents and officials from rural areas often have different views on land-use and building regulation from their more urban and suburban counterparts. In short, it's not always an easy matter—politically or legally—for state officials to preempt local prerogatives. Sometimes state officials do recognize the need to reduce the risk to their constituents, and significant improvements can be made. Indeed, officials in South Carolina have adopted the new International Building Code after long resisting the idea of having a statewide code (i.e., South Carolina has moved into the “mandatory” category since May’s 1997 study).

It should also be mentioned that the adoption of building standards and codes, in and of itself, does not ensure that residential and business structures will be protected from hazards. At best, there is a time lag between the adoption of a building code and its impact on local residential and commercial property. Codes are usually enforced only for new construction. Moreover, as was found when Hurricane Hugo struck South Carolina in 1989, some communities had building codes but no inspectors. Other communities had untrained or ill-trained inspectors and grossly inadequate code enforcement. Communities are faced with the question of whether to require retrofitting of old buildings to reduce the risk from high winds, flood, and/or earthquake, and such retrofitting can be very expensive. Mandating retrofitting, in fact, can have very negative consequences for the community. High costs can cause property owners to abandon old structures and to tear down structures needing extensive retrofitting and replace them with new structures that meet the code (which may mean eliminating low-income housing and replacing it with moderate- to high-income housing or

Examples of Construction Methods to Reduce Property Losses

Wind damage can be reduced by:

- using hurricane clips or straps to connect rafters and trusses to the walls of a home;
- strengthening the connection between building walls and foundation;
- reinforcing garage doors;
- using head and foot bolts to strengthen doors;
- using structural adhesive to strengthen connections between roof sheathing (plywood cover) and rafters;
- using shatter-proof glass and/or shutters to protect windows from wind-blown debris; and
- adding a safe room to protect family members from tornadoes and other high winds.

In addition to the base flood elevation required by the National Flood Insurance Program, flood damage can be reduced by:

- raising electrical service panels and the air conditioner two to three feet above the base flood elevation;
- adding a waterproof veneer to the home;
- having openings in foundation walls so that floodwaters can flow through, thereby reducing the likelihood that the water flow will cause a collapse of the foundation and the structure;
- adding flood shields to doors; and
- installing sump pumps to pump out water.

Earthquake damage can be reduced by:

- bolting the walls of the home to the foundation;
- strapping water heaters and other appliances securely to walls;
- strengthening hanging light fixtures;
- strapping bookcases and shelves to walls;
- putting heavy objects on lower shelves; and
- using flexible connectors for gas and electrical appliances.

Fire damage can be reduced by:

- using mesh or screens to keep flames and sparks out of chimneys, attics, crawl spaces, and other openings, including under porches;
- using nonflammable materials in roofing, shutters, and other building materials; and
- using fire-resistant landscaping around the structure.

tearing down historic buildings). Old business districts might never recover financially. Such was the case in Oroville, California, following a 1975 earthquake (Olson and Olson, 1993).

In Oakland, California, following the Loma Prieta earthquake in 1989, the city identified the structures, mostly built of unreinforced masonry, that might be considered dangerous and attempted to mandate retrofitting of those properties. Officials were met with considerable resistance from property owners. Realistically, the cost of retrofitting would have been prohibitive for some property owners, and the alternatives—abandonment of the property or simply tearing it down—would not have been in the best interest of the community. The compromise arrived at by a coalition of economic development advocates (i.e., property owners and builders), seismic safety advocates, and historic preservation advocates was to require the abatement (retrofit) of those structures posing the most risk to residents and encouraging the abatement of others. Soon thereafter, it became economically feasible for many property owners to retrofit their structures. The coalition recommended not requiring retrofitting for all the old buildings in town, because to do so would have destroyed the character of the downtown. Therefore, some structures are still vulnerable to earthquakes and dangerous for residents (Olson, Olson, and Gawronski, 1999). The lesson is that eliminating all risk is not possible and may not be economically feasible. The best that can be expected is that residents understand the risk and learn to live with it. But, when the level of acceptable risk exceeds what might be considered reasonable, they should be strongly encouraged to prepare for the disaster that is likely to come.

Public purchase of property on floodplains, in landslide areas, or in any other kind of hazardous area can also be controversial, although some communities have chosen to take property out of the market when property owners die or the property has been severely damaged and significant reconstruction would be necessary. Using bought-out properties as parks and recreational areas with minimal development is a popular mitigation strategy.

Building standards may also include specific construction methods to reduce losses from wind, fire,

Source: USAA, 2001.

flood, earthquake, and other hazards. Many of the disaster-resistant building and landscaping practices may eventually be incorporated into local building codes. For example, the new code in the state of Florida requires windows to be resistant to wind-blown debris and doors to be strengthened. New technologies and building practices are promoted as enhancements to current building standards and may be incorporated into construction as they are accepted by the building industry. Acceptance of new practices is much faster if prospective homeowners demand more disaster-resistant residences.

FEMA and Mitigation

Mitigation became the focus of FEMA's efforts in the mid-1990s. The National Mitigation Strategy was issued in December 1995 and called for greater "partnership" between the federal government and state and local governments in the reduction of hazards. Disaster mitigation efforts have since expanded under Sections 404 and 406 of the Stafford Act of 1988 (FEMA, 1997). Section 404 of the Stafford Act created the Hazard Mitigation Grant Program, which provides funding for mitigation projects. The Volkmer Amendment in 1993 improved the cost-sharing arrangement and increased the amount of federal money available for mitigation projects. The grant program is funded at a level equal to 15 percent of the federal money spent on public and individual assistance programs, minus administrative expenses, for a disaster. Proposed projects have to be consistent with the overall mitigation strategy for the area, and the grants can cover up to 75 percent of the cost of the project. Section 404 of the Stafford Act provides similar financial support for mitigation projects for government and nonprofit agencies, including such activities as debris removal following the disaster.

The mission of FEMA prior to implementation of the Government Performance and Results Act (GPRA) tended to be defined in terms of outputs rather than results. The agency reported numbers of training programs and students, interagency contacts and agreements, presidential disaster declarations, dollars paid out in disaster assistance, and so on. In 1997, when FEMA's goals were expressed in terms of overall results, the orientation of the organization to other federal agencies and to state and local governments changed significantly. The new

strategic goals were to: 1) protect lives and prevent the loss of property from all hazards; 2) reduce human suffering and enhance the recovery of communities after disaster strikes; and 3) ensure that the public is served in a timely and efficient manner (FEMA, 1997). Each of the goals had performance measures—e.g., a 10 percent reduction in risk to human life and a 15 percent reduction in the risk to property by FY 2007—and five-year strategies as required by GPRA. The most recent set of performance goals is very similar, although the second goal is now to "prevent or reduce harm and losses from future disasters through mitigation efforts" (GAO, 2001: 1). The emphasis is clearly on mitigation. FEMA lacks authority to address all of the threats to life and property by all hazards, and it necessarily has to enlist the participation of partners to do so. Not all of the risks relate to construction, although the disaster experiences of the 1990s strongly suggest that nonstructural mitigation measures (e.g., building codes and land-use regulations), as well as some structural mitigation measures, can significantly reduce losses.

In the 1990s, FEMA's organizational structure changed from one characterized by the separation of national security or civil defense programs and its state and local programs. James Lee Witt, then director of FEMA, reorganized the agency around the four functions of mitigation, preparedness, response, and recovery to better integrate programs and to reflect the philosophy of an "all-hazards" emergency management paradigm. With the need to develop new instruments to achieve its national goals, the agency's role changed dramatically. The new strategic plan was appropriately named the

“Partnership for a Safer Future,” and the necessity for developing partnerships with state and local governments was acknowledged early in the document (Waugh, 1999). While FEMA had had programs that involved partnerships with other public, private, and nonprofit organizations, such as a collaboration with the National Association of Home Builders (NAHB) in the 1980s to encourage safer construction practices, the new pursuit of partnerships encouraged a more open agency. The results expected of the agency also encouraged a focus on mitigation rather than recovery. An early product of that reorientation was a video and educational materials on wind-resistant construction in hurricane-prone areas entitled “Against the Wind.” FEMA, NAHB, the American Red Cross, The Home Depot, and the Georgia Emergency Management Agency cosponsored the effort in 1993, and more videos have since been produced. After 1995, the focus on partnerships greatly expanded.

The Federal Government and Safe Construction

In terms of building regulation, the federal government does have some regulatory power. For example, following the Hurricane Andrew disaster in 1992, when as many as 18,000 manufactured housing units (mobile homes) in south Florida and Louisiana were damaged or destroyed, legislation was enacted to require that manufactured housing in high-wind areas meet stricter wind standards. Since July of 1994, manufactured homes sold in Hawaii and 25 counties along the coasts of Alaska, Louisiana, Florida, and North Carolina are required to withstand winds of 110 mph. Manufactured homes sold in another 91 counties in Alaska, Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, North Carolina, Virginia, Massachusetts, and Maine must be able to withstand winds of 100 mph (McConnaughey, 1994). The regulations are based upon the federal government’s authority relative to interstate commerce, because manufactured housing is moved from one state to another.

Many federal agencies do have less direct roles in the regulation of building and the encouragement of safe construction practices. The U.S. Department of Commerce, through the National Institute of Standards and Technology (NIST), tests building

materials and encourages the adoption of uniform building codes; the U.S. Fire Administration promotes fire safety; the Consumer Product Safety Commission regulates standards for products sold to consumers (including flammable products that might increase fire risks in residences and businesses); and the U.S. Department of Labor enforces standards to protect the health and safety of workers. The U.S. Department of Health and Human Services regulates safety issues in health care facilities; the Department of Housing and Urban Development regulates safety issues in HUD-financed buildings; the Federal Aviation Administration regulates safety in airports; the General Services Administration regulates safety in federal buildings; and the Department of Veterans Affairs regulates safety in its health care facilities. Other federal agencies have direct and/or indirect roles in ensuring appropriate building codes are followed in the construction of federal facilities and facilities built with federal money (Hy, 1990: 242-243). There are federal responsibilities to address workplace safety and corruption or malfeasance in construction projects. There are also federal programs, in addition to Project Impact, that encourage attention to hazards and the need to mitigate them.

FEMA and Safe Construction

Hazard reduction through the encouragement of safe construction has been pursued through FEMA programs such as the National Flood Insurance Program (NFIP), the Firewise program to reduce wildfire losses in urban-woodland interfaces, and a variety of other programs. The promotion of “safe rooms” by FEMA is intended to reduce human casualties from windstorms. NFIP is the most far-reaching of these efforts.

The National Flood Insurance Program (NFIP)

Over 12 million households are located in flood-prone areas in the United States, and those areas cover 150,000 square miles (FEMA, 1998), almost the size of the state of California. Over 19,000 communities with almost 4.4 million policyholders participate in NFIP, which provides economic incentives to communities that adopt land-use regulations for floodplains. The incentives are discounted flood insurance rates to the residents of those communities that adopt such measures as restricted development, elevated construction, and

flood-proofing buildings in floodplains. Failure to join NFIP and to adopt at least minimal hazard-reduction measures disqualifies communities and their residents from receiving federal disaster assistance following floods. FEMA's estimate of flood loss reductions in FY2000 due to mitigation efforts is \$1 billion (GAO, 2001: 3).

NFIP provides economic and political incentives to reduce the risk of flooding, including reducing the use of building designs and standards that may increase flood losses. The federal government is the final guarantor of flood insurance because the insurance industry itself is unable to provide coverage when flood events affect very large areas or flood insurance may be prohibitively costly for property owners. The numbers of communities in each Community Rating System (CRS) class are indicated in Table 2.

As Table 2 indicates, the number of communities enrolled in NFIP is growing. The number of communities that have improved their CRS classification is strong evidence of the adoption of flood mitigation programs. However, most of the communities are categorized as Class 10 and do not qualify for flood insurance discounts. NFIP has experienced problems in terms of property owners buying flood insurance following a major flood, largely in response to government pressure to buy insurance,

Table 2: National Flood Insurance Program Communities

Class	Number of Communities		Discount
	April 2000	October 2001	
Class 3	0	1	35%
Class 4	0	2	30%
Class 5	3	12	25%
Class 6	20	33	20%
Class 7	83	134	15%
Class 8	341	362	10%
Class 9	460	394	5%
Total	907	938	

Source: FEMA/NFIP, 2001.

The National Flood Insurance Program

The National Flood Insurance Program was created in 1968 following devastating floods and the rising costs of disaster relief. The program is designed to make federally backed flood insurance available in communities that agree to manage their floodplains to reduce flood losses. The Federal Insurance Administration, within FEMA, administers the program. NFIP has reduced flood losses by almost \$800 million per year, and homes built to NFIP standards have 77 percent less damage per year. "And, every \$3 paid in flood insurance claims saves \$1 in disaster assistance payments" (FEMA/NFIP, 2001).

The Community Rating System (CRS) was added in 1990 to encourage local flood mitigation efforts. Under the National Flood Insurance Reform Act of 1994, it became a means of rewarding local efforts by providing discounted flood insurance rates based upon community CRS points. Points or credits are given for implementing specific mitigation measures, such as: 1) public information, including advising the community about the hazard and providing data to insurance agents; 2) mapping and regulations, including mapping and regulation of areas under development; 3) flood damage reduction, including relocating or retrofitting flood-prone structures and maintaining the community's drainage systems; and 4) flood preparedness, including having warning systems and dam safety programs. Technical assistance is provided by FEMA and other agencies. The activities are verified by the Insurance Services Office, Inc. (ISO), which grades communities for fire insurance and now is responsible for implementing the Building Code Effectiveness Grading Schedule for the insurance industry.

There are 10 CRS classes. Class 1 requires 4,500 or more points and provides a discount of 45 percent. Class 5 requires 2,500 to 2,999 points and provides a discount of 25 percent. Class 10 communities, with 0 to 499 points, receive no discount. Communities located in non-SFHA (Special Flood Hazard Areas) receive a maximum of 5 percent discount if they have at least 500 points. SFHA communities are located wholly or partially on floodplains and have a significant risk of flood loss. Communities must do elevation certificates for all properties built on the floodplain after the CRS application and, if they are designated repetitive loss communities, they must have repetitive loss projects in those areas subject to frequent flooding.

and then letting their policies lapse. FEMA has contracted for a study of NFIP with particular attention to these kinds of issues. In addition to discounted flood insurance rates, communities participating in NFIP can also qualify for other federal assistance, including the Flood Mitigation Assistance Program, the Hazard Mitigation Grant Program, and U.S. Army Corps of Engineers projects.

NFIP has not been without critics, however. They argue that NFIP encourages the development of floodplains because property owners are assured that they can get insurance coverage and thus reduce their losses. NFIP also may suggest that floodplains can be safely developed when the wiser course may be to prohibit development altogether. Moreover, the threat to deny disaster assistance to property owners who develop known hazardous areas, such as coastal zones prone to flooding due to storm surges, has not deterred such development. Indeed, federal and state programs often encourage development because they fund the infrastructure, such as roads and bridges, that makes development economically feasible. The infrastructure itself lures prospective buyers and generates demand for homes and businesses.

Project Impact

Project Impact is a logical extension of the principle stated by former FEMA Director Witt that “all mitigation is local.” It also reflects the shift from FEMA’s reactive approach to disasters in the 1980s and early 1990s to a more proactive approach to managing hazards and reducing their potential effects. The focus on reducing property loss through disaster-resistant communities, rather than simply providing recovery monies following disasters, is central to the agency’s strategic plan (see GAO, 2000). The program is designed to permit communities to set their own priorities for hazard-risk reduction. The initial challenges are to organize the projects well enough so that maximum public participation will be encouraged, reasonable priorities will be set based upon the risk assessment, and the organization can sustain itself and operate over time. Clearly it is necessary for local participants to understand and be committed to the goals of Project Impact. It is not the intent simply to create a committee of local government officials to run the project, as might be done for other community

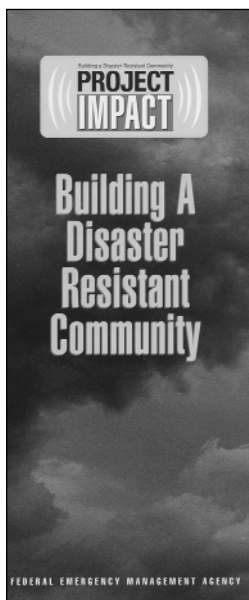
efforts. Broad public participation, including the business community, is needed if the communities are to develop consensus on goals and objectives. Public/private partnerships are expected to be one of the cornerstones of the program. FEMA’s roles are to provide technical assistance, financial support, and connection with the other Project Impact communities to encourage cross-fertilization. Local politics, interorganizational conflicts, and public apathy have to be overcome, and energetic and capable coordinators are essential to the maintenance of commitment and the recruitment of new partners.

FEMA is developing partnerships at the national level to assist Project Impact communities, particularly in technical areas such as risk assessment, and the communities themselves are developing partnerships with local businesses, community organizations, universities and colleges, and other institutions to generate and support local mitigation efforts. The partnership with Fannie Mae is to provide loans for homeowners to finance mitigation measures. The partnership with the International Code Council (ICC) is to support the efforts of that organization to develop and encourage the adoption of effective building codes. The ICC membership includes the major building code and standard-setting organizations: Building Officials and Code Administrators, International Conference of Building Officials, and Southern Building Code Congress International (FEMA, 2001). The American Red Cross’ Disaster Resistant Neighborhood initiative is also connected to FEMA’s effort.

In terms of Project Impact’s attention to disaster-resistant construction, the list of recommended mitigation measures includes wildfire-, wind-, flood-, and earthquake-resistance measures. A lengthy checklist of such measures is included in the program’s guidebook (FEMA, 2001).

In 1997, the Disaster Research Center at the University of Delaware began an assessment of Project Impact’s seven pilot communities. Other Project Impact communities were added to the study in subsequent years. The assessment of the first year of the program concluded that there were start-up problems in terms of the availability of funding and the uncertainty that funding would be available for subsequent years despite the stated intent of FEMA to provide funding for five years.

Project Impact



The Disaster Resistant Community Initiative, which came to be known as Project Impact, was begun in the summer of 1997. As the FEMA brochure states, "The goal of Project Impact is to reduce the personal and economic costs of disasters by bringing together community leaders, citizens, and businesses to prepare for and protect themselves against the ravages of nature." Through the program, the federal government was to act as a catalyst, helping citizens and communities deal with the hazards that might cause

loss of life and/or property. The four phases of Project Impact were: 1) "building community partnerships, 2) assessing risks, 3) prioritizing needs, and 4) building support and communicating what you are doing." Recommended actions for individuals included adopting measures to reduce the risk of fire, flood, and other damage to their homes and buying flood

insurance. Recommended actions for businesses included complying with fire and building codes and buying flood insurance. Recommended actions for government officials included reviewing building standards and codes, ensuring that codes are enforced, and adopting new standards where needed to increase disaster resistance (FEMA, 1998).

At the national level, Project Impact has recruited public, private, and nonprofit sector partners to assist FEMA and participating communities. The private partners include such firms as the Associated Builders and Contractors, which helps with promoting the program; Michael Baker Jr., Inc., which determines whether homes are in floodplains; Dewberry & Davis LLC, which provides community education and hazard awareness programming; ESRI, which provides geographic information on hazards; Fannie Mae, which offers loans to homeowners to finance mitigation measures; the International Code Council, which is developing and encouraging the adoption of building codes; KeepSafe and the Portland Cement Association, which are promoting the building of safe rooms; and Wall-Ties & Forms, Inc., which is promoting aluminum forms for the construction of concrete homes and safe rooms. Other private partners help promote the program and encourage the adoption of disaster-resistant construction and disaster preparedness (FEMA, 2001).

The creation of the community "partnership" or network was contingent upon the energy and effectiveness of key personnel. According to Kathleen Tierney, turnover in key personnel can be critical and can threaten the continuity of efforts. The learning curve for officials who did not participate in the initial kickoff of the Project Impact community was steep. While newly elected and appointed officials could be added to the program, they lacked the understanding and commitment of those officials who were engaged at the beginning. There is also a critical need for an energetic and effective Project Impact coordinator. Grassroots organizing and local capacity building were critical, and someone has to organize and, at the same time, maneuver within the local political system (Disaster Research Center, 1998).

In terms of the relationship between community partners and FEMA, the report pointed out the importance of federal guidance, connection with other Project Impact communities, and reliable funding. Initially, some community leaders feared that funding might end before the five-year period was over, and that fear tended to lessen the initial level of commitment. Nonetheless, community participation in Project Impact stimulated change in terms of a longer-term view of hazards and the threats they pose, and some communities were successful in finding private and Community Development Block Grant funding to supplement FEMA funding. The involvement of colleges and universities and other professional groups was a notable benefit, as well. The expansion of community participants made it possible to leverage a variety of new resources. The next steps would be to

move from single mitigation projects to building disaster resilience into other local programs, including economic development programs, and to encourage building-standard development and code adoption (Disaster Research Center, 1998).

The assessment of the second year of the pilot phase focused on the status of mitigation efforts in Project Impact communities, including the adoption of building codes for new construction and for retrofitted structures and upgrading the communities' CRS ratings. Overall, there was a 15 percent increase in the "types of mitigation actions that had been adopted" (Disaster Research Center, 2001: 3). Communities were trying more kinds of activities. Smaller communities, in particular, were making progress in defining their risks, and the fastest increases in mitigation programs were among the communities with the poorest records prior to joining the Project Impact program. Community involvement had increased, as well. Greater access to government expertise and the increased involvement of community organizations helped the smaller communities in particular. The authors conclude that "[i]n summary, within two years, the seven pilot communities have completed 20 new assessment and mitigation activities and are working on an additional 56 projects.... It does seem highly unlikely that this level of activity would have taken place without the infusion of financial and technical resources from Project Impact" (Disaster Research Center, 2001: 8). In terms of partnership building, by the end of the first year the communities averaged 26 partner agreements, with most being local or nongovernmental. By the end of the second year, the communities averaged almost 47 partners with an average of 35.4 local and nongovernmental partners (Disaster Research Center, 2001: 10-13).

Maintaining and growing the partnerships was viewed as a critical process, with an emphasis on recruiting local business partners. Integrating Project Impact goals into community development and other policies and programs was slow, and knowledge of the programs, including the meaning of the term "mitigation," was growing. The report drew no conclusions regarding the effectiveness of

administrative structures. Most of the communities had hierarchical structures but decentralized decision processes, reflecting the active involvement of community groups and other agencies in the program. The willingness of participants to collaborate, to donate time and other resources, and to invest themselves in the projects suggests that the less formal aspects of the Project Impact relationships were most important to them. As in the assessment of the first year of the pilot phase, the assessment of the second year concluded that the coordinator was a critical player in terms of maintaining momentum, recruiting partners, and assuring that the focus on mitigation activities was not lost (Disaster Research Center, 2001: 26).

Local goal setting, the location of the project, and community participation were considered essential issues by the participants. The location of the project in an emergency management office was seen as a problem, particularly if the office was attached to an emergency response agency. The preference was for locating the Project Impact program in the city or county manager's office. Relationships with some state emergency management offices and some FEMA regional offices were also viewed as problematic. Some communities also were bothered by the need to spend money quickly, particularly when projects were approved late (Disaster Research Center, 2001: 27-30).

Components of the Safe Construction Networks

In addition to pursuing policy goals through its own programs, FEMA has used a variety of partnerships and looser collaborations to achieve policy goals. Two of the closest relationships at this point are between FEMA and the Blue Sky Foundation of North Carolina and the Institute of Business & Home Safety. The missions of both organizations are focused on building standards, and IBHS also has a “fortified home” program that demonstrates safe construction techniques. FEMA has also been involved with numerous model home programs, some sponsored by the U.S. Department of Agriculture through the Agricultural Extension Service and the U.S. Department of Energy through the Consortium for Advanced Residential Buildings, and some sponsored by state government, public utilities, and other organizations.

Blue Sky Foundation

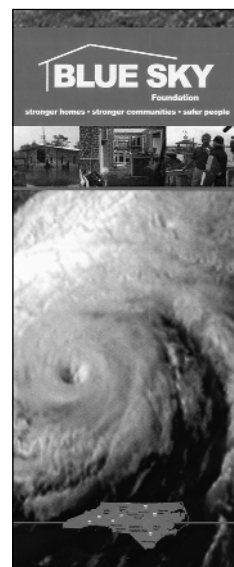
The Blue Sky Foundation of North Carolina focuses on the building industry role in safe construction practices. As a nonprofit foundation, it relies on funding from FEMA and other agencies and organizations. It also serves as an intermediary between FEMA and builders and developers, providing training and education on safe construction practices and encouraging the adoption of stronger building standards.

Most of the funding for Blue Sky projects has come from FEMA, through the North Carolina Division of Emergency Management in the form of project grants. The foundation conducts conferences, including its Markets for Mitigation Forum in August of 2001, and produces educational materi-

als to encourage builders and developers to adopt safe construction methods. The foundation’s efforts have been given momentum by the state mitigation and recovery efforts following Hurricane Floyd in 2000, and it has strong ties to the North Carolina Division of Emergency Management. The founda-

Blue Sky Foundation of North Carolina

The Blue Sky Foundation of North Carolina began in 1997 with the goal of reducing loss of life and property due to storms and other kinds of hazards. The nonprofit corporation was an offshoot of the Blue Sky Project that was created in 1995 by the town of Southern Shores, North Carolina. The impetus for the creation of the foundation was a series of major hurricanes and other windstorms that struck the state in the 1990s. Sustainable development through safe construction and appropriate land use are the focus of the foundation’s programs. Blue Sky sponsors conferences, training programs, public forums, and workshops on hazard-resistant construction practices. It also sponsors research on best practices in safe construction (Blue Sky Foundation, n.d.).



tion has also developed a close working relationship with the Institute for Business & Home Safety and supports that organization's Showcase and "fortified home" programs. Most of the foundation's current projects involve identifying and encouraging best practices. Blue Sky's website lists IBHS and FEMA publications on best practices, and the foundation is developing new research initiatives to address the need for structures resistant to technological hazards, including terrorism, as well as natural hazards (Markle, 2001).

The Blue Sky Foundation has an important role in bridging the gap between FEMA, IBHS, and other organizations that promote safe construction, and the building industry, which tends to be very wary of attempts to regulate construction practices. The building industry's preference is to rely on market forces and wait for a demand for safer construction to develop. But, if all builders are required to meet the same standard, no one is at a competitive disadvantage. Builders and developers are resistant to new standards that they, in turn, have to sell to prospective buyers. On the other hand, if there is a market for hazard mitigation measures, such as roof straps, they will address that demand. The Blue Sky Foundation does promote such building practices as the use of structural adhesives and hurricane strapping to make buildings more resistant to high winds.

Photo: Dave Saville/FEMA News Photo



The hurricane straps seen here are an example of how a structure can be reinforced to survive severe winds.

Institute for Business & Home Safety

The Institute for Business & Home Safety (IBHS) is broadly focused on encouraging safer construction. Its programs include disseminating information about building codes and disaster-resistant building practices, as well as information to the insurance industry on loss reduction and risk. The building code efforts aim to provide accurate information to insurance companies about risk and to property owners so that they can ensure their property is in compliance with the code.

FEMA is working with IBHS on the development of an integrated building code, integrating the standards of the several major building codes in the nation, and increasingly on safe construction practices. IBHS's "fortified home" program has several model homes in the Tampa Bay area of Florida, and FEMA is providing financial support for some of the effort. Disaster mitigation features include wind- and fire-resistant roofing, impact-resistant windows and shutters, more secure connections between homes and their carports and porches, stronger entry and garage doors, and fire-resistant landscaping (USAA, 2001). IBHS has a demonstration project "on the elevation/reconstruction of a repetitive loss home" in Ruskin, Florida. The project was begun as a partnership between FEMA and Hillsborough County, and the home was rebuilt to be two feet above Base Flood Elevation. IBHS joined the effort to address wind hazards, as well as the flood hazard. IBHS and FEMA are partnering in a project in Holmes Beach, Florida. FEMA is funding most of the reconstruction to meet IBHS's Fortified Criteria and FEMA's Coastal Construction Manual guidelines. Other collaborations are anticipated (Sciaudone, 2001).

FEMA necessarily has a focus on making low- and moderate-income housing more disaster resistant, because such housing tends to be more vulnerable to damage and because the agency has an obligation to the public to address broad social needs. IBHS can focus on marketing more up-scale disaster-resistant homes to consumers who can more easily afford the added expense of disaster-resistant features. IBHS, the Blue Sky Foundation, and FEMA also have working relationships with the Florida Association for Safe Housing (FLASH) to encourage building code integration. Much of the effort has concentrated on wind resistance, but the inclusion

Institute for Business & Home Safety

The Institute for Business & Home Safety, formerly the Insurance Institute for Property Loss Reduction, was created by the insurance industry to “reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters” (IBHS, 2001). IBHS’s members are insurance and reinsurance companies. The institute’s priorities are: 1) consistent building codes, including drafting codes, targeting opportunities to encourage code adoption, and gathering data on disaster losses; 2) its “Fortified ... for safer living” program to encourage builders and homeowners to build disaster-resistant homes; 3) retrofitting homes to reduce losses, including impact-resistant windows and shutters; 4) the Community Land Use Evaluation form for planners to rate land-use practices, including consideration of hazards; and 5) converting the institute’s paid-loss database to a geographic information system.

IBHS’s new facility in Tampa, Florida, is in the city’s Museum of Science and Industry. When completed, the facility will house the National Center for Natural Disaster Safety, which will serve as an educational facility to encourage attention to natural hazards and how to prevent or reduce their effects, a training facility for building professionals, and a research library.



of fire and flood measures, as well as earthquake-resistant measures in places like Charleston, South Carolina, that have significant seismic risk, are being considered.

Other Safe Construction Efforts

There are other federal efforts to encourage better construction practices. For example, the U.S. Department of Agriculture, through the Agricultural Extension Service (AES), has been encouraging

communities, builders, property owners, and students preparing for the building professions to embrace energy efficiency as a criterion for building. AES programs are increasingly embracing the concepts of sustainability and disaster resistance, as well. The 113 Calhoun Street Sustainable Living Center is a partner in the Charleston, South Carolina, Project Impact program and serves as a model for disaster-resistant elements in retrofitted historic homes. “FEMA provided the majority of the bricks and mortar funding for the renovation of the project here [113 Calhoun St.] supported by SC Sea Grant [South Carolina Sea Grant Consortium] and Clemson [University] Extension” (Judge, 2001). The center is a renovated historic home, and the foundation that operates it is a partner in Charleston’s Project Impact program. The center demonstrates methods for melding historic preservation, energy efficiency, and disaster resistance in a community in which retrofitting old structures is a major concern.

The U.S. Department of Energy (DOE) also is involved in model home building through the Consortium for Advanced Residential Buildings (CARB). The Mercedes Homes project in Melbourne Beach, Florida, involves construction of town homes. The project is sponsored by DOE as a model of energy efficiency and should be complete in 2002. The Department of Housing and Urban Development and, later, FEMA became sponsors as disaster-resistant elements were included in the homes. Better construction methods can increase both energy efficiency and disaster resistance. There are also model homes financed and operated by utilities, building materials manufacturers, and other private concerns, some in collaboration with CARB, that also encourage disaster mitigation.

Some of the listed model home projects (see “Selected Model Home Programs”) have received FEMA funding and support. FEMA’s Region IV office has construction specialists who monitor safe construction efforts in the region and provide assistance when the projects are consistent with FEMA’s goals. Nonprofit programs to encourage disaster-resistant construction, as well as energy efficiency and other improvements, are good marketing tools because they are more accessible to homeowners and builders than centralized facilities and can

Selected Model Home Programs

113 Calhoun Street Center for Sustainable Living, Charleston, South Carolina

The 113 Calhoun Street Center for Sustainable Living is operated by the 113 Calhoun Street Foundation. The foundation's mission "is to create communities more resistant to losses from natural hazards—flood, wind, and earthquake—and to promote ways of living that help people conserve natural resources" (The 113 Calhoun Street Foundation homepage). The project partners are the South Carolina Sea Grant Consortium, Clemson University Extension Service, City of Charleston, Charleston County, the Federal Emergency Management Agency, and the South Carolina Emergency Preparedness Division. A Project Impact partner, the center is a 125-year old home that is being retrofitted to make it flood, earthquake, and hurricane resistant. The chief of mitigation and risk assessment of the South Carolina Emergency Preparedness Division and the director of the National Oceanic and Atmospheric Administration's Coastal Services Center serve on the foundation's board. IBHS and FEMA provide information on hazard-resistant construction (113 Calhoun Street Foundation homepage).

Hurricane House, University of Florida/St. Lucie County Cooperative Extension Office

The University of Florida built the Regional Windstorm Damage Mitigation Training and Demonstration Center, or Hurricane House, for the Florida Department of Insurance to disseminate information on wind-resistant construction. The house is one of several located around the state to demonstrate to builders and the public how to implement hazard-reduction measures. Cut-away sections of walls permit visitors to see hurricane straps, fasteners, and other features that can be used to retrofit old homes to increase wind resistance and built into new homes (St. Lucie County Cooperative Extension Service homepage).

Florida House Learning Center, Sarasota County Technical Institute

The Florida House Learning Center is a joint project of the Cooperative Extension Service for Sarasota County, the Sarasota County Technical Institute, the Southwest Florida Water Management District, and the Florida House Institute. The center demonstrates construction methods to encourage energy efficiency and, through the "Model Florida Yard," encourages the adoption of practices to protect water quality and reduce water usage and to encourage recycling, wildlife gardening, edible gardening, and other yard uses (Sarasota County, Cooperative Extension Service homepage).

Protecting Home and Family Project, State University of New York (SUNY) Maritime College Campus, New York

The mission of the Protecting Home and Family (PHF) Project is "[t]o establish and promote a standard for new construction and retrofitting of residential and critical buildings in natural hazard-prone areas which will eliminate or reduce the impact of future disaster, thereby increasing the safety of individuals and families and reducing property damage and overall disaster costs" (New York State Emergency Management Office, Strategic Plan: Mitigation, Section II, p. 1). The public partners include FEMA, the New York State Insurance Department, the New York City Mayor's Office of Emergency Management, the Nassau County Emergency Management Office, and the Suffolk County Department of Fire, Rescue and Emergency Services. The private partners include IBHS, the American Institute of Architects-Disaster Response Corporation, and building industry and insurance firms. The program objectives are to increase the numbers of single-family residential buildings built and retrofitted to resist wind, flood, and other natural disaster damage; build new and retrofit older multi-family residential structures for special populations so that they are resistant to wind, flood, and other natural disaster damage; and increase the number of hazard-resistant critical facilities and retrofit older critical facilities in those parts of the state with wind, flood, and other natural hazards. The training center project on the SUNY Maritime College campus is being built by a public/private partnership and will provide training courses to builders, architects, suppliers, engineers, building code enforcement personnel, and students. Educational programs are to be offered to government officials and the public. The project is expected to increase public and construction industry awareness of safe construction methods, encourage the adoption of such construction methods, and create a market for disaster-resistant construction (New York State Emergency Management Office, Strategic Plan).

'LaHouse' Learning Center, Louisiana State University

'LaHouse' Learning Center is being built on the Louisiana State University campus, with completion expected in 2002. Energy efficiency, durability, occupant health, marketability and cost effectiveness, and appeal are the principal criteria used in constructing the house. Durability includes resistance to environmental hazards, such as hurricanes and floods (*LSU AgCenter News*, June 8, 2000; *LSU AgCenter, "LaHouse: The Louisiana House Learning Center"* brochure).

reflect local building needs. The State Farm House in Deerfield Beach, Florida, was part of that community's Project Impact effort. Deerfield Beach turned over responsibility for the house, an educational center, to the State Farm Insurance Company.

FEMA's "safe room" program is also related to the safe construction efforts. "Safe rooms" are being promoted principally to reduce the loss of life from tornadoes and other severe windstorms. Private firms have developed model "safe rooms" based upon FEMA's specifications. The Project Impact program in Louisville/Jefferson County, Kentucky, has "safe rooms" in its model homes, and the program in Warren County, Kentucky, has actually created a "safe room fire station." The Alvaton Fire Station facility is a shelter for the community.

Obviously efforts are under way by other agencies to encourage safer construction and wiser land use. The Florida Department of Insurance, for example, has a model home in Pensacola. The state of Florida has encouraged retrofitting of commercial properties through its "Open for Business" program. Money has been earmarked to encourage small firms to implement energy conservation measures. The money saved by the energy retrofits has been used to provide no-interest loans to businesses so they can implement hazard-reduction measures. City workers have donated their time after hours to help the small firms develop business continuity plans, as well.

Leveraging the Safe Construction Networks

Catastrophic property losses during the 1990s have given impetus to the promotion of safe construction. The movement includes a number of major public, private, and nonprofit actors arrayed in several networks pursuing related but significantly different priorities. In general, the efforts have focused on: 1) encouraging the development of a market for safe construction so that buyers will insist on wind-, fire-, flood-, and earthquake-resistant homes and businesses; and 2) getting state and local officials to assist by requiring compliance with appropriate building standards and codes and by adopting appropriate land-use regulations.

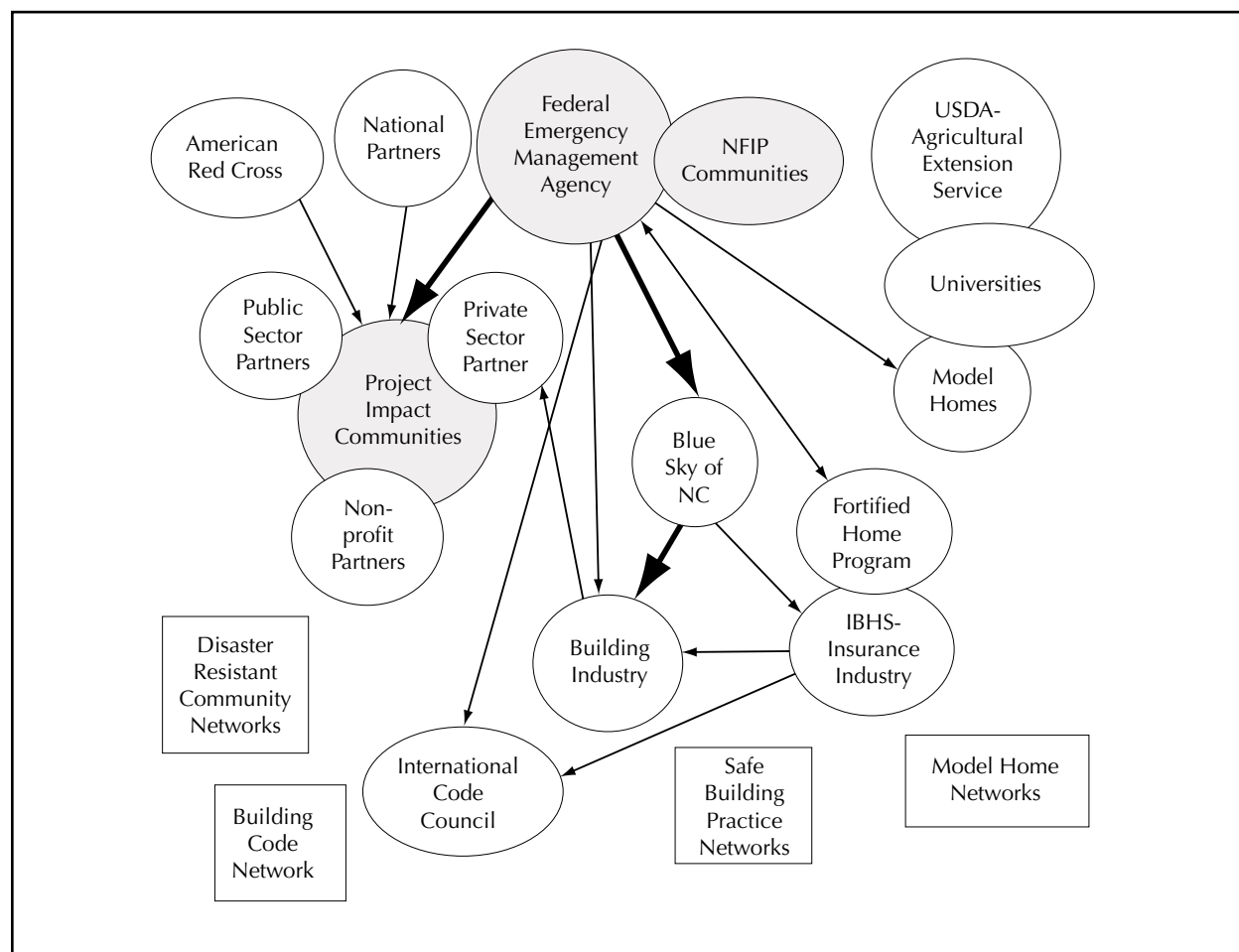
It is difficult to separate the efforts into neat categories, but they have included a wide range of major actors. FEMA is addressing the need for safe construction through Project Impact, the National Flood Insurance Program, the Firewise Program, the Safe Room Program, and other efforts such as the model home programs. IBHS is addressing the need through its “fortified home” program and its efforts to integrate building codes and encourage their adoption. The Blue Sky Foundation is addressing the need through its research and education programs and promoting the efforts of both FEMA and IBHS. Other organizations, ranging from the Florida Association for Safe Housing to the Agricultural Extension Service, are also engaged in the effort to encourage safer construction. These efforts are also being tied to the movements for “smart growth” and “sustainable development.” FEMA is one of several major actors—sometimes leading, sometimes supporting, and sometimes following—but the agency has more technical and financial resources than the other actors.

FEMA has a strategic goal of reducing property losses significantly, and the promotion of safe construction is one of the principal means to that end. FEMA’s efforts include:

- the Project Impact program, which provides technical assistance for hazard reduction in member communities;
- the National Flood Insurance Program, which requires flood-resistant construction on floodplains;
- participation in the International Code Council’s effort to integrate building codes;
- support of the Association of State Floodplain Managers’ efforts to encourage flood-proofing of new and retrofitting of old homes;
- the promotion of “safe rooms” to reduce the loss of life from tornadoes, including research ongoing at Texas Tech University and Clemson University; and
- partnerships with the Blue Sky Foundation, IBHS, and other organizations to encourage safe construction practices and affordable disaster-resistant designs.

Project Impact community efforts can involve a mix of projects from building code adoption and land-use regulation to building or retrofitting homes for fire and flood resistance and from more limited disaster-resistance building methods to safe rooms.

FEMA has had to develop working relationships within a number of networks involved in promoting safe construction. Those relationships and networks

Figure 1: The Safe Construction Networks

are illustrated in Figure 1. FEMA has direct regulatory control over communities involved in NFIP. The flood insurance program requires that communities implement floodplain management measures, including land-use regulations and building standards, in order to qualify for discounted flood insurance and for disaster assistance following future floods.

FEMA has considerable influence with its partners in the Disaster Resistant Community or Project Impact program. The reliance of Project Impact communities on FEMA's financial support and technical assistance provides considerable leverage, although, as the Disaster Research Center assessments concluded, local participants greatly resent it when FEMA officials are too heavy-handed in their promotion of the agency's preferences. The partnerships require sensitivity to local priorities. The Project Impact participants also require more

personal attention by FEMA officials. The relationships have to be cultivated and maintained.

The efforts to integrate building codes into one comprehensive and effective code are being driven by the International Code Council, which includes representatives of the major building code and standard-setting bodies. In this case, FEMA may largely serve a supporting role in terms of providing technical expertise and financial support.

Lastly, FEMA is actively involved in promoting the development of safer construction practices. Through the Blue Sky Foundation's training and education programs, IBHS's "fortified home" program, and, increasingly, through Agricultural Extension Service and other model home programs, the agency promotes the adoption of disaster-resistant building methods. The relationship with the Blue Sky Foundation is more of a princi-

FEMA's Relationships with the Safe Construction Networks

National Flood Insurance Program (NFIP) Communities Network

Strong influence, regulatory control, contractual relationships

Project Impact Community Networks

Strong/moderate influence, resource role, formal partnership relations

Building Code Network

Moderate/weak influence, supportive role, formal relationship

Model Home Networks

Variable influence, supportive role, less formal relationships

Safe Building Practice Networks

Weak to moderate influence, educational/supportive role, partnerships and ad hoc relationships

pal-agent arrangement, with FEMA funding fueling the foundation's programs. The partnership with IBHS is based more on mutual interests, although they do have significant differences in priorities.

The need for a multi-level approach to hazard reduction is manifest. Development on the coasts, near woodlands, on floodplains, and in seismically active zones is expanding rapidly, and the consequence is increased exposure of people and property to wind, flood, and seismic hazards, as well as to other environmental hazards. A seemingly obvious solution is to restrict development in hazardous areas and prohibit development entirely in the most hazardous areas. To some extent that can be done through land-use regulation, including mandatory programs such as the National Flood Insurance Program and state coastal zone management programs. Buyout programs for repetitive loss properties can reduce some of the exposure, as well. To the extent that some losses cannot be anticipated because of limited knowledge of hazards, there will continue to be significant losses. An answer to that problem is to change how we build homes and businesses to ensure that they are disaster-resistant to the greatest extent feasible. Cost will continue to influence building practices, but there are relatively

inexpensive ways to make structures less vulnerable to wind, flood, fire, and earthquake.

Working through existing networks to promote safe construction is necessary. Broad participation encourages agreement on ends and means and compliance with policy choices. But, working through networks does present some challenges. The assessments of FEMA's Project Impact reflect the unique nature of networks. As Mandell and Steelman argue, networks require a different kind of management. In this case, disaster resistance provides the common mission, although some local participants still find the term "mitigation" confusing, and some state and federal participants are uncertain about local priorities and policy choices. The effort is seen as long term. There is risk in terms of the commitment of resources if the effort is terminated, as government programs frequently are. Collaborative problem solving, open decision processes, and innovative approaches are encouraged. The formal partnership agreements are less important than the commitment and involvement. Indeed, some of the Project Impact partners have not been active participants. The role of the coordinator is critical in terms of communicating the goals of the program, facilitating interaction, and building trust among the participants, not in terms of executive control and decision making. It may also be the case that FEMA's regulatory role through NFIP creates distrust. The response of Project Impact community participants was that FEMA officials were trying to foist certain kinds of projects on them rather than accept local priorities and proposals. The building industry, as well, may be slow to respond to recommendations because of concern that they may become regulations—the "slippery slope" of policy making. Gentle nudges, some funding, or some research assistance may be more effective than a more aggressive approach.

The problem FEMA may experience in working within the networks is that it is more difficult to measure success in these diffuse terms than it is to measure more direct program impacts. The success of disaster-resistant programs, for example, is difficult to measure until they have been put to the test in a disaster. Capacity in the abstract will always be suspect until tested, and excess capacity may be a waste of resources (Waugh, 1999). Measuring the strength of inter-organizational linkages, individual

and group commitment, non-monetary contributions, and spillover effects is difficult. Nonetheless, the cultivation of effective networks to accomplish necessary tasks is worthwhile. Broad public involvement in the networks assures commitment to the ends and consensus on the means. Citizens and community groups bring local perspectives that government officials do not have and, as Frank Fischer argues (2000: 148), a sociocultural rationality that is lacking in decision processes dominated by technical experts. The real goal is to create a culture of mitigation or disaster resistance because the success of the effort is dependent upon sustained individual, family, and community compliance.

How might the FEMA efforts through Project Impact, the Blue Sky Foundation, IBHS, and the other organizations be compared? Certainly the efforts are interrelated. The grassroots nature of Project Impact may assure that it has a long-term impact and has the greater potential to create a culture of disaster resistance. Whether the Project Impact communities are developing a momentum of their own that will continue if FEMA support is terminated is an issue that should be examined. The model home projects in Florida that were products of Project Impact are connected with other disaster-resistant construction projects, as well as with energy efficiency and affordable housing projects. The local priorities of the Project Impact communities may prove invaluable in terms of generating innovative approaches to disaster resistance, including new safe construction measures. Tying the efforts to “smart growth” strategies and sustainable development plans would provide more momentum.

Working within the network is a challenge for FEMA, and it does require a less aggressive, more collaborative style of leadership. Indeed, the critical variable is the leadership. FEMA’s representatives in the network, like Project Impact coordinators and other network managers and leaders, have to have strong interpersonal skills, uncommon patience, and considerable political acumen in order to interact effectively. They must also have energy to invest in the inter-organizational processes. Just as the boundaries of organizations become fuzzy, the boundaries of work relationships become fuzzy.

The network is a high-maintenance set of working relationships.

In most respects, it is easier to interact with an organization like IBHS that has a clear mission and its own resources. The relationship can be mutually beneficial as long as the goals are similar and the areas of cooperation can more easily be negotiated. A difference that FEMA does have with IBHS is that FEMA has to give priority to making affordable housing more disaster resistant. The effort has to result in reducing the vulnerability of middle- and low-income housing. IBHS, on the other hand, has to create marketable technologies to reduce vulnerability, and that may mean a focus on high-income housing. Nonetheless, FEMA and IBHS do have common interests that can be pursued in partnership.

The relationship with the Blue Sky Foundation is more of a principal-agent relationship. FEMA can largely define the terms, although maintaining a close working relationship is very useful. The Blue Sky Foundation can focus on almost any kind of disaster and any aspect of construction. It can be a convenient and effective conduit for FEMA, IBHS, or any other safe construction program. It is limited in terms of geography and its staff and resource base, but it is flexible and responsive.

Conclusions

Safe construction is a policy goal that is easy to define. There is broad support within government at all levels, the insurance industry, the mortgage industry, and even the building industry for strengthening building standards and making construction more disaster resistant. The social and economic costs of disaster recovery are powerful arguments for a mitigation approach. What is lacking is public demand for safe housing. People still want to live in hazardous areas and build at the lowest cost possible. They will pay for more floor space and amenities, but they will not pay much more for safety features hidden in walls and ceilings.

Governments can address the problem of housing vulnerability by strengthening building standards and by adopting and enforcing appropriate building codes and land-use regulations. This is the solution for reducing the vulnerability of new construction. But, stronger regulations and wiser planning may do little to reduce the vulnerability of old construction. Also, population growth and other factors increase risks. As hazards are better understood, different mitigation strategies may be required. Hazards themselves may change. Geophysical and meteorological disasters tend to run in cycles, and we may experience more frequent and more powerful disasters in the future. In short, the risk is growing and hazards are changing. The challenge is to be prepared for whatever changes may come. Therefore, the cultivation of a “culture of mitigation” is the wisest solution, and that requires developing market demand for safe construction.

FEMA has been reasonably successful in encouraging safe construction through direct and indirect means. There are important lessons to be learned from FEMA’s experience in promoting safe construction through the various networks. Clearly, the experience has demonstrated that traditional administrative approaches are insufficient and that more collaborative and comprehensive approaches may be more effective in the long term. The following “lessons” are drawn from FEMA’s successful and less than successful efforts:

Lesson One: Mitigation should be the policy priority for property loss reduction. Maintaining a consistent and comprehensive focus on mitigation assures a clear mission.

Lesson Two: The cultivation and maintenance of network relationships requires long-term effort. Relationships are built upon trust, and trust is earned. Trust facilitates communication and organizational cooperation. Respect for the perspectives and priorities of the other participants is essential.

Lesson Three: Regulatory control can be instrumental in achieving some policy objectives, but it can interfere with the development of broader cooperative relationships. It is difficult to be both a “parent” and a “peer” or partner.

Lesson Four: Broad participation in decision making, particularly priority setting, helps develop support for ends and means and encourages compliance with decisions. Hierarchical relationships do not encourage such consensus building.

Lesson Five: Working through networks can create a synergy and a creativity that are lacking in hierarchical systems. Personal commitment and a sense of efficacy encourage innovation.

Lesson Six: The federal government—or state government, for that matter—can influence policy change even if it does not have direct authority in that policy arena. Encouragement and support can facilitate the efforts of other actors and networks involved in the effort. Attempting to impose authority is counterproductive.

Lesson Seven: Not all networks are alike, and different skills may be necessary to cultivate relationships within each. In some cases, contractual relationships work best. In some cases, informal relationships work best. In some cases, non-participation may be the best choice.

Lesson Eight: Leadership is the key to successful networks and organizations. Providing or facilitating leadership will improve the chances for success.

Lesson Nine: A clear mission is the cornerstone for cooperation. Successful partnerships and successful networks are built upon common interests.

Lesson Ten: Open and transparent processes facilitate understanding and encourage participation. Closed systems, limited participation, and hidden agendas confound collaboration.

What is striking about the network operations examined in this study is the personal connections among the major participants. There is considerable interaction among FEMA, IBHS, Blue Sky, FLASH, 113 Calhoun Street Center, the state emergency management agency, the local emergency management agency, and other representatives. The personal connections provide the glue that holds the network together. They facilitate communication and assure coordination of efforts. They also create a synergy that is lacking in closed systems that do not share information or other resources and do not encourage personal investments. Part of that synergy is due to the diversity of perspectives on safe construction. Conflict stimulates innovation. The synergy is also due to the mutual respect and understanding among the individuals involved in the networks and their commitment to the goal of

safe construction. This does not mean that all participants are motivated or able promoters of safe construction. Effective organizational participation is still dependent upon effective leadership. Not all participants understand the need for open communication, broad community involvement, and significant personal commitments of time and energy.

What has not been addressed thus far and should be raised at least in passing is the issue of accountability. Leveraging networks may be the most effective tool for achieving national policy goals, but it is difficult to hold FEMA or any other agency responsible for the achievement of goals when it has so little direct control. In that sense, it is unfair to the agency. At the same time, it presents a problem to political leaders who desire to hold the agency accountable for its actions (see Peters, 2000: 38). This may account for some of the opposition to Project Impact by officials of the George W. Bush administration. Aside from the fact that Project Impact is the creation of a prior administration, the program is dependent upon local political support and media attention. A change in administrations always affects relationships, although FEMA's career personnel provide continuity.

FEMA's efforts to encourage safe construction through the several networks have had mixed results. Some Project Impact communities have been very successful and others have languished. However, on the whole, the efforts have advanced the cause of safe construction and undoubtedly have reduced property losses. The questions are whether other policy instruments can be as effective, particularly when the goal is as fuzzy as creating a "culture of mitigation" within the American populace, and whether public agencies can as effectively deal with the demands of network "management" to achieve public purposes as FEMA has done.

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Interviews/Correspondence:

Dr. Charles A. Doswell III, National Severe Storm Laboratory, NOAA/University of Oklahoma

Dr. Elizabeth K. Judge, Clemson University and the 113 Calhoun Street Center, Charleston, S.C.

Don Markle, Executive Director, Blue Sky Foundation of North Carolina

Steven Randolph, Project Impact Coordinator, FEMA Region IV

Dr. Claudette Reichel, Housing Specialist, LaHouse Project Chair, LSU AgCenter

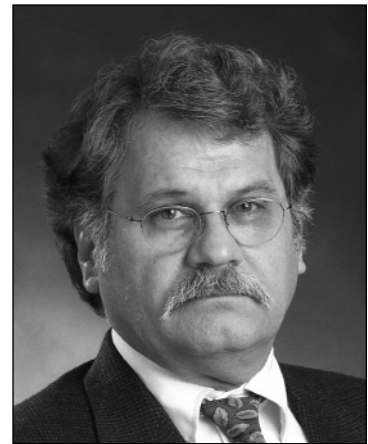
Dr. Jasmin Riad, Dromedary Disasters International, Inc., Atlanta, Georgia

Jeffrey C. Sciaudone, PE, Associate Director of Engineering, Institute for Building & Home Safety, Tampa, Florida

Chuck Vance, Fortified Program Manager, Institute for Building & Home Safety, Tampa, Florida

ABOUT THE AUTHOR

William L. Waugh, Jr., is Professor of Public Administration, Urban Studies, and Political Science in the Andrew Young School of Policy Studies at Georgia State University (GSU). He taught at Mississippi State University and Kansas State University prior to moving to GSU in 1985. Currently, he teaches graduate courses on disaster management, administrative theory/organizational behavior, human resource management, and public policy, and an undergraduate course on “global disasters.” His research focuses on the design of disaster policies and programs and on the coordination of multi-organizational and intergovernmental operations.



He is the author of *Living with Hazards, Dealing with Disasters* (2000), *Terrorism and Emergency Management* (1990), and *International Terrorism* (1982); co-author of *State and Local Tax Policies* (1995); and co-editor of *Disaster Management in the U.S. and Canada* (1996), *Cities and Disaster* (1990), and *Handbook of Emergency Management* (1990), as well as author of numerous articles and chapters published in the United States, Canada, Europe, and Asia. He currently serves as co-editor of the *Review of Policy Research* (formerly *Policy Studies Review*).

Dr. Waugh has developed college-level courses for the Federal Emergency Management Agency, conducted training programs for local emergency managers and law enforcement officers, and been a consultant to public, nonprofit, and private organizations on disaster management, strategic planning, and leadership development. He serves on the Certified Emergency Manager Commission; on the board of directors of the Family Assistance Foundation, a nonprofit organization that helps airlines deal with aviation disasters; and as academic advisor to Regional Science Institute, an international environmental analysis firm based in Japan.

He grew up on military bases in the United States and Germany and attended the University of Maryland in Munich. In 1970-71, he served in the U.S. Army. He received an A.B. from the University of North Alabama (1973), an M.A. from Auburn University (1976), and a Ph.D. in political science from the University of Mississippi (1980).

KEY CONTACT INFORMATION

To contact the author:

William L. Waugh, Jr.

Professor

Department of Public Administration and Urban Studies

Andrew Young School of Policy Studies

Georgia State University

Atlanta, GA 30303

(404) 651-4592

e-mail: wwaugh@gsu.edu

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For additional information, contact:

Mark A. Abramson

Executive Director

The PricewaterhouseCoopers Endowment for The Business of Government

1616 North Fort Myer Drive

Arlington, VA 22209

(703) 741-1077, fax: (703) 741-1076

e-mail: endowment@us.pwcglobal.com

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