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## NEWS & ANALYSIS

## Increasing Resilience to Natural Hazards: Obstacles and Opportunities for Local Governments Under the Disaster Mitigation Act of 2000

by Anna K. Schwab and David J. Brower

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*Editors' Summary: The term natural disaster is a misnomer. As Anna K. Schwab and David J. Brower note in this Article, disasters do not occur naturally, they occur only where humans have placed themselves in the way of natural hazard events. Therefore, decisions about the way human environments are initially constructed can mitigate the effects of natural hazard events. They distinguish between resistance and resilience, explaining that attempts to resist forces of nature by trying to contain or control nature itself have largely been unsuccessful. By contrast, resilience efforts, such as hazard avoidance, environmental preservation, and education and outreach, reduce vulnerability to natural hazard events. The authors explain a range of resilience techniques and discuss hazard mitigation planning under the Disaster Mitigation Act of 2000.*

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### I. Hazard Mitigation Opportunities for Local Governments

This Article focuses on some of the many ways local governments can increase community resilience to the impacts of natural hazards. The first part explores various approaches to mitigation available to local communities through exercise of their basic police power. The second half discusses local hazard mitigation planning in the context of the Disaster Mitigation Act (DMA) of 2000, with commentary on the effectiveness of the Act for producing quality mitigation plans at the local level.

#### A. Natural Disaster: A Misnomer

Disasters do not happen naturally. Certainly there are natural hazards in the world: inevitable, recurring, unstoppable events that are the result of geological, hydrological, meteorological and other natural phenomena outside the realm of our control.<sup>1</sup> When a natural hazard event of sufficient mag-

nitude collides with the human environment, a disaster occurs.<sup>2</sup> Hazards are a part of nature; they are "natural." Disasters are not.<sup>3</sup>

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local governments preparing hazard mitigation plans under the DMA: avalanche; coastal erosion; coastal storm; dam failure; drought; earthquake; expansive soils; extreme heat; flood; hail-storm; hurricane; land subsidence; landslide; severe winter storm; tornado; tsunami; volcano; wildfire; and windstorm. FEMA, MULTI-HAZARD MITIGATION PLANNING GUIDANCE UNDER THE DISASTER MITIGATION ACT OF 2000 (2003); the North Carolina State Hazard Mitigation Plan identifies 49 different natural hazards that may impact the state. NORTH CAROLINA DIVISION OF EMERGENCY MANAGEMENT, NORTH CAROLINA SECTION 322 NATURAL HAZARDS MITIGATION PLAN (2004), available at <http://www.dem.dcc.state.nc.us/mitigation/322plan.htm> [hereinafter NATURAL HAZARDS MITIGATION PLAN].

2. "[T]he vulnerability of people, society and the built environment may alone determine the magnitude at which an event becomes a disaster." DAVID ALEXANDER, *CONFRONTING CATASTROPHE 9* (Oxford Univ. Press 2000).
3. More than one author has proposed that natural events are not even to be characterized as hazards until they impact human settlements: "An ecological view of sustainable place recognizes that events such as hurricanes, earthquakes, and floods are natural (though they may be exacerbated by human activities), and that only when we choose to build structures and place settlements in their paths do they become 'hazards.'" TIMOTHY BEATLEY & KRISTY MANNING, *THE ECOLOGY OF PLACE: PLANNING FOR ENVIRONMENT, ECONOMY, AND COMMUNITY 99* (Island Press 1997) [hereinafter BEATLEY & MANNING]; "[M]any would argue that 'natural' hazard is a misleading term, as very little is natural about phenomena in which the danger results largely from human decision making, land use and socio-economic activities, in as much as these impinge upon the predictable domain of extreme natural events." ALEXANDER, *supra* note 2, at 10.

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[Editors' Note: This Article appears in the book *Losing Ground: A Nation on Edge*, edited by John R. Nolon & Daniel B. Rodriguez, published in 2007 by the Environmental Law Institute (ELI). The book can be ordered by either calling 800-433-5120 or logging on to the ELI website at <http://www.eli.org>.]

1. The Federal Emergency Management Agency (FEMA) suggests the following 19 types of hazards in its guidance material for state and

### B. *Armoring Against Nature: The Traditional Approach to Mitigation*

The traditional approach to preventing disasters from occurring, that is, to keep natural hazards from intersecting with the built environment has been to contain or control the hazard itself.<sup>4</sup> For decades, agencies such as the U.S. Army Corps of Engineers (the Corps) have protected homes and businesses in hazard areas by building structures designed to hold back the forces of nature. Breakwaters, levees, seawalls, and other engineered solutions are meant to make communities resistant to natural hazards.<sup>5</sup> These hard structures are the most appropriate choice for many communities, protecting people and property from rising floods and breaking waves. Unfortunately, in some cases these protective mitigation tactics have actually increased the potential for disaster, by providing a false sense of security that encourages people to build in hazardous areas; when the structure fails, more people and property are in a place of danger than might have been otherwise.<sup>6</sup> Moreover, large-scale armoring is typically very expensive. Many of these measures are difficult or costly to implement and their benefits are frequently short-lived.<sup>7</sup> When budgets are tight, routine maintenance and repairs to levees and seawalls may not take place, increasing the likelihood of failure.

Large-scale protection works can also impair nature's ability to mitigate against storms, erosion, and floods.<sup>8</sup> Numerous studies provide examples of engineering works that have been counterproductive at best, or have even exacerbated vulnerability by interfering with natural processes. For example, levees built to provide flood protection can destroy riparian habitat and heighten downstream floods.<sup>9</sup> Seawalls meant to stave off erosion can actually increase erosion rates, block normal landward migration of barrier islands, and eventually result in a highly engineered shoreline with no natural beach,<sup>10</sup> thus effectively removing the natural buffer between upland areas—where oceanfront development is located—and the eroding forces of wind and waves that a wide beach provides.<sup>11</sup> Channel diversions

constructed for flood control purposes can rob surrounding wetlands and marshes of silt deposits and starve them of nutrients, thereby reducing or eliminating the floodplain's natural capacity to absorb floodwaters.<sup>12</sup>

Aside from shortcomings of increased exposure to hazard risk, the expense of construction and maintenance, and degradation of the natural environment, the assumption behind the armored protection approach to mitigation is inherently flawed. Building *resistance* to natural hazards is a never-ending proposition, one with few guarantees of success. A far more sustainable approach and one with fewer potential negative impacts involves increasing *resilience* to natural hazards. While it may seem a matter of mere semantics, preferring the term *resilience* to that of *resistance* indicates a difference in attitude.<sup>13</sup> By referring to our efforts to soften the impact of natural hazards as becoming more resilient, we acknowledge our limitations with regard to those hazards. We acknowledge that humans cannot stop hazards from occurring, but we can make communities safer and able to recover more quickly after a disaster through proactive mitigation measures.

### C. *Principles for Building Resilience at the Local Level*

Fortunately, local communities have at their disposal many ways to increase resilience, methods that fall well within the police power delegated to units of local government from their respective states. In the effort to become more resilient to the impacts of natural hazards, communities should adhere to a few basic principles, both to ease the process in terms of efficiency and to increase the political feasibility and overall effectiveness of mitigation measures that are adopted to reduce vulnerability.

The first such principle for successful resilience building involves awareness and acceptance. Community members must be aware of the natural hazards they face, and must accept that they are capable of and responsible for addressing their hazard risks. Respect for the natural processes that determine the geography and hydrology of the environment can help reduce vulnerability to extreme hazard events. A community that wishes to be an active participant in its own fate must be informed of the risks, so it can pursue appropriate actions to reduce those risks.

The second principle necessary for true resilience is an articulation of values among the citizenry and elected officials. A "mitigation ethic" must be infused into community policies and integrated into the mainstream of community decisionmaking, so that hazard resilience is addressed as an important and valid concern worthy of public attention.<sup>14</sup> A mitigation ethic also helps fulfill a local government's affirmative duty to ensure the safety of its citizens from the im-

4. "It was humans against the elements, and no one doubted that humans could out-engineer the forces of nature." DAVID M. BUSH ET AL., *LIVING BY THE RULES OF THE SEA* 66 (Duke Univ. Press 1996).

5. "[O]ur historic approach to natural hazards has been one of resisting and armoring against them." BEATLEY & MANNING, *supra* note 3.

6. "[I]n trying to reduce vulnerability by taming nature, the situation is often made worse, not better." Raymond J. Burby, *Natural Hazards and Land Use: An Introduction*, in COOPERATING WITH NATURE: CONFRONTING NATURAL HAZARDS WITH LAND USE PLANNING FOR SUSTAINABLE COMMUNITIES I (Raymond J. Burby ed., 1998) [hereinafter Burby]; "[S]tructures have been found to actually induce development in hazardous areas and to increase, not decrease, the likelihood that when a large flood or hurricane does occur, losses truly will be catastrophic." *Id.* at 8.

7. DEPARTMENT OF CITY & REGIONAL PLANNING, UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, *TOOLS AND TECHNIQUES: PUTTING A HAZARD MITIGATION PLAN TO WORK* (1998) [hereinafter *TOOLS AND TECHNIQUES*].

8. "[M]any mitigation efforts themselves degrade the environment and thus contribute to the next disaster." DENNIS S. MILETI, *DISASTERS BY DESIGN: A REASSESSMENT OF NATURAL HAZARDS IN THE UNITED STATES* 3 (Joseph Henry Press 1999) [hereinafter MILETI].

9. See MILETI, *supra* note 8.

10. TIMOTHY BEATLEY ET AL., *AN INTRODUCTION TO COASTAL ZONE MANAGEMENT* (Island Press 2001).

11. Although beach nourishment projects can temporarily provide sand to widen the beach, this can be an expensive and short-lived mitigation tactic.

12. In the aftermath of Hurricane Katrina, there is evidence that diversion of the Mississippi River for flood control and navigation purposes accelerated the loss of wetland acreage in southern Louisiana, a factor that contributed to the massive flooding that occurred in that area.

13. "[T]he term 'resiliency' to disasters is used rather than 'resistance' to disasters because of a sense that resiliency has a slightly broader, more flexible connotation." MILETI, *supra* note 8, at 264.

14. "One study . . . found that on average local officials rank natural hazards thirteenth in importance, just behind pornographic literature, among the issues with which they are dealing." Burby, *supra* note 6, at 15 (citing PETER ROSSI ET AL., *NATURAL HAZARDS AND PUBLIC CHOICE: THE STATE AND LOCAL POLITICS OF HAZARD MITIGATION* (Academic Press 1982)).

pacts of natural hazards. The grant of police power from the states to units of local government comes with the authority to enact ordinances and rules to regulate behaviors and land uses in the best interest of the community at large. One of the primary responsibilities of a local government is to protect the public's health and safety, which includes protection from natural hazards.<sup>15</sup> Questions of liability and dereliction of duty may arise if property owners are permitted to live in areas of known hazard risk. Local governments can avoid potential legal issues through enactment of mitigation policies that keep citizens safe and prevent foreseeable disaster losses.

A third principle for building resilience at the local level involves full public engagement in the process of mitigation planning and goal formulation. Although public participation can be a bulky and time-consuming activity (the process of notification, solicitation, and incorporation of citizen response is a major undertaking), the end result is worthwhile. Formulation of goal statements through citizen involvement can help determine and express how mitigation fits into the community's vision of its future and how mitigation values will influence local decision-making. Including the proposals and ideas of the local populace can also help increase citizen buy-in and provide a sense of ownership in the mitigation actions that will eventually be implemented.

Public involvement in mitigation activities may lead planners and citizens to identify where mitigation goals overlap with other community goals. They may even discover that much is already being done to decrease vulnerability to natural hazards, without it having been acknowledged as such.<sup>16</sup> By crafting policies that serve multiple objectives, a greater number of interest groups will be willing to support local mitigation programs. For example, local efforts to preserve open space or conserve environmentally sensitive lands can often serve to mitigate hazard impacts by providing a natural buffer against flooding, storm surge, or erosion. On the other hand, it may be discovered that the community has been exacerbating its hazard risk unwittingly, and that other community goals (a push for economic development in hazardous locations, for example) have been counteracting mitigation efforts. A community can lessen the chances that mitigation strategies will be derailed later on by involving interest groups whose objections may be based on unfounded fears that mitigation will curtail economic growth. With an emphasis on linking the principles of hazard mitigation to an expanded vision of growth and development that takes divergent views and perspectives into account, the community can balance risk reduction with other social, economic, and environmental goals.<sup>17</sup>

The fourth major principle that should guide communities seeking hazard resilience is a willingness to invest in the community's capacity for developing and carrying out mitigation policies and programs. There are many

components to a community's capacity to engage in mitigation, including:

- fiscal capability (the ability to fund or to seek funding for mitigation projects and activities);
- *technical capability* (the ability to carry out hazard identification and vulnerability analyses to produce accurate information regarding where and to what extent hazards are likely to impact the community);
- *legal capability* (the ability and willingness to use the local police power to enact necessary land use and other regulations that restrict the use of hazardous lands for building purposes while respecting the rights of private property owners to realize their investment-backed expectations);
- *institutional capacity* (the ability to create the institutional framework or to designate responsible positions within the existing institutional framework to implement and sustain mitigation policies); and
- *political capacity* (the willpower to propose and carry out enduring mitigation strategies notwithstanding the shortened horizon of some elected positions).

Capacity building infers that the knowledge base necessary to plan for and implement hazard mitigation measures must primarily reside within the community itself. To this end, the hiring of outside assistance, i.e., consultants, is not to be overindulged. Of course, consultants often play a vital role in mitigation programming at the local level; indeed, for smaller communities with limited resources the use of consultants may be the only way hazard mitigation efforts can be made at all. Yet while consultants (for a price) can perform many of the activities involved in generating and analyzing important background data, the real action of devising strategies, adopting goals and implementing policies must be carried out by those with a lasting stake in the ultimate resilience of the community.

## II. Approaches to Mitigation: Action Strategies for Local Governments

Broadly speaking, there are five interrelated approaches to reducing vulnerability at the local level. Within these categories is a wide selection of specific mitigation strategies and actions, many if not all of which are well within the police power of local governments.<sup>18</sup> Whether a particular strategy falls into one category or another is a matter of debate, but in general terms mitigation techniques can be classified as follows<sup>19</sup>:

15. Christopher City, *Duty and Disaster: Holding Local Governments Liable for Permitting Uses in High-Hazard Areas*, 78 N.C. L. REV. 1535 (2000).

16. "Disaster-resilient communities are built with the same building blocks that create resiliency to other social and environmental problems." MILETI, *supra* note 8, at 64.

17. See, e.g., Raymond J. Burby, *Making Plans That Matter: Citizen Involvement and Government Action*, 69 J. AM. PLAN. ASS'N 33-49 (2003).

18. "Many disaster vulnerabilities can be addressed with existing tools and information, given a commitment to solving the problem." MILETI, *supra* note 8, at 64.

19. There are myriad ways to classify mitigation tools and techniques. For example, guidance material issued by the Community Rating System (CRS)—a program supported by the National Flood Insurance Program (NFIP) that awards communities for taking measures to reduce their flood risks—divides mitigation approaches into six different categories, each of which contain mitigation actions with varying point values. The six CRS categories are: (1) prevention; (2) property protection; (3) natural conservation; (4) emergency services; (5) structural mitigation; and (6) public information. Author Dennis Mileti, Director of the Natural Hazards Research and Appli-

- structural engineering projects
- hazard avoidance
- property protection
- environmental preservation
- education and outreach

In the section that follows, we explore how local governments can apply each of these five approaches to meet the mitigation needs of their communities.

#### A. Structural Engineering Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environment or by interfering with the natural progression of the hazard event. As mentioned earlier, large-scale armoring against nature is expensive (usually beyond what local government acting alone can afford) and may encourage development in unsafe areas. We will not discuss in further detail the more elaborate systems of engineered mitigation, except to reiterate their potential for failure, and the dire consequences that can occur when they do fail.<sup>20</sup>

On a smaller scale (at the community level), structural projects are usually designed by engineers and managed or maintained by public works staff, and include such necessary actions as the construction and maintenance of storm sewers and drainage infrastructure. In most states, storm drainage is provided by counties and municipalities as one of the services required to maintain healthy and safe living conditions. The spending power of local governments allows public monies to be directed to these essential services, and the power of acquisition allows local governments to purchase or condemn land and rights-of-way for stormwater management.

Numerous urban flooding incidents have occurred for the simple reason that drainage systems were not built with adequate capacity to handle stormflow. At the construction stage, local governments can impose performance standards, including the proper sizing of culverts, ditches, channels, pipes, and other components of a drainage system to meet the volume of stormwater anticipated during normal and above-average rainfalls.

Day-to-day maintenance of stormwater systems, including clearing debris on a regular schedule and avoiding a backlog of repairs, is a relatively inexpensive investment that communities can make to reduce the likelihood of a major flooding event. This approach emphasizes the need for local governments to examine existing policies and procedures to ensure that the community is not inadvertently increasing its hazard vulnerability through simple neglect or oversight.

When designing or retrofitting a stormwater management system, a community would do well to anticipate any changes or modifications that could occur to flood levels due to future development and growth. Rapid urbanization

cations Information Center at the University of Colorado at Boulder describes five major techniques for sustainable hazard mitigation: (1) land use planning and management; (2) building codes and standards; (3) insurance; (4) prediction, forecast, and warning; and (5) engineering. See MILETI, *supra* note 8.

20. When Hurricane Katrina hit New Orleans in August 2005, the force of the storm caused levees which had protected the city from flooding to breach in several places. The city was inundated, engulfed with water that reached up to 20 feet in some locations.

can strain the ability of local governments to manage the greater volume and velocity of stormwater runoff caused by increases in impervious surfaces and other changes in local drainage patterns associated with new development. By making capital improvements and replacing and upgrading stormwater facilities before demand from more customers overwhelms the system, communities can often head off drainage issues before they occur. To take an anticipatory approach to stormwater management, planners and engineers of the Charlotte-Mecklenburg Storm Water Services (CMSWS) Department have adapted geographic information system (GIS) technology to model the impact of future flood events. The program is used to assess the possible changes in flooding caused by various land use, development patterns, and growth scenarios. As part of a comprehensive stormwater management and flood hazard mitigation program, the CMSWS has used the GIS data to determine the appropriate use of structural flood control measures in the floodplains of the metropolitan area, basing decisions on future build-out conditions.<sup>21</sup>

In addition to traditional municipal stormwater management and flood control projects, communities are increasingly choosing alternative approaches that do not disturb the natural morphology and hydrology of urban stream channels, such as soil bioengineering, vegetated buffers, and other best management practices. Local governments are also designing urban channels that mimic natural stream flows, methods that are relatively self-maintaining while they improve water quality and provide aquatic and wildlife habitat. Garden rooftops, pervious surface materials, and re-use of water as “grey water” are other innovative, “green” methods of stormwater management that are becoming more standard.

#### B. Hazard Avoidance

Over the long term, the most straightforward and cost effective strategy to minimize or prevent damages and losses from natural hazards is to guide development away from hazard-prone areas.<sup>22</sup> In other words, we attempt to avoid disasters altogether by removing people and property from where the built environment intersects with the hazard event.<sup>23</sup> The most direct way of achieving avoidance objectives is through acquisition of hazard areas, accompanied by demolition or relocation of hazard-prone structures when homes and businesses are present. A second means of hazard avoidance involves land use planning and regulation, including the enactment of zoning and subdivision ordinances. A third method to bring about hazard avoidance invokes the local jurisdiction’s powers of spending and taxation. We will briefly consider these various methods of avoiding natural hazards in this section. The hazard avoidance approach is most appropriate when alternative locations within the community are avail-

21. NORTH CAROLINA DIVISION OF EMERGENCY MANAGEMENT, HAZARD MITIGATION SUCCESSSES IN THE STATE OF NORTH CAROLINA (1999) [hereinafter HAZARD MITIGATION SUCCESSSES].

22. “Sustainable communities seek first to avoid exposure of people and property to natural hazards. This means not building on floodplains, avoiding steep-slope and landslide potential areas, and setting development back from high-erosion coastal zones.” BEATLEY & MANNING, *supra* note 3, at 99.

23. “The goal of the locational approach is to reduce losses in future disasters by limiting development in hazardous areas.” Burby, *supra* note 6, at 9 (emphasis in original).

able for development.<sup>24</sup> Communities that are at or close to build-out have more limited options for hazard avoidance, although encouraging higher density building and in-fill development in safe locations can help alleviate the constraints imposed by a scarcity of land.

### 1. Hazard Avoidance Through Acquisition and Relocation

Enabling legislation typically empowers local governments to acquire and hold property for public purpose. By acquiring lands in hazard-prone areas, a community can ensure that the land will be put only to those uses that are compatible with the nature of the hazard risk. Picnic shelters and ball fields, for instance, are more appropriate uses of land in the floodplain than homes and businesses. Although acquisition is typically one of the most expensive mitigation tactics, in the long run it is often less expensive to acquire and demolish a building than to repeatedly provide for its reconstruction.<sup>25</sup>

While the power of eminent domain is a necessary tool for acquiring land for certain community needs (schools and road rights-of-way are typical uses of condemnation), it is rarely invoked for hazard mitigation purposes. More common is the acquisition of land from a willing seller.<sup>26</sup> Owners of properties that have experienced repetitive losses and who face probable future flooding are often very willing to sell, so long as the benefits are explained fully, and a viable alternative is made available to them.

On the downside, since title to the property is transferred to the public domain, acquisition may remove properties entirely or in part from the local government's property tax rolls, depending upon the type of acquisition program used. However, the cost of losing tax revenues from these properties is often lower compared to the cost of providing services to properties in hazard areas and the periodic costs of rescue and recovery from disasters. Another disadvantage with acquisition projects in some communities, particularly in rural or impoverished areas, is that the local government becomes the responsible party with respect to maintaining and preserving the acquired land as open space in perpetuity. However, local governments may transfer title to acquired land to other government agencies or to a nonprofit agency, such as a conservation or environmental organization. These options have enabled some communities to benefit from the removal of people and structures from hazard areas, without the burden of continual property maintenance.

Communities have used various methods to fund acquisitions using local financial resources, including bond referendums, taxes and fees, or partnerships with nonprofit organizations. However, the vast majority of buy-out programs are financed with federal funds, such as the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) program administered by the Federal Emergency Management Agency (FEMA). Counties and municipalities have also made use of Community Development

Block Grant funds from the U.S. Department of Housing and Urban Development, which are available for projects that benefit low- and moderate-income persons by removing slum and blighted conditions, or that address conditions of urgent need.

Reuse of acquired properties varies according to individual communities' needs and the location and condition of the purchased land. Local governments have created public parks, incorporated land into open space systems, and let the land revert to its natural vegetative state as experimental or communal gardens. Some communities have built picnic shelters, tennis courts, ball fields, and bicycle or jogging paths on acquired land to encourage public uses. Acquisition has also been used to increase floodplain storage capacity, preserve wetlands, maritime forest, estuaries and other natural habitats, and protect aquifer recharge zones and riparian buffers. Many communities have discovered that in addition to providing the benefits of reduced property losses from repeated hazards, these new uses enhance the aesthetics and environmental integrity of the community, provide recreational opportunities, and contribute to overall quality of life.

Many acquisition programs throughout the country have accomplished the goal of removing thousands of people and buildings from harm's way. Without disparaging the success of these projects in attaining this very important goal, some observers have noted that few acquisition projects are carried out as part of a holistic management plan that addresses the longevity of the project. Research has shown that loss reduction is less pronounced and mitigation is less effective when isolated parcels are purchased, creating a "snaggletooth" effect. Such a checkerboard pattern of purchases is also more costly and difficult for the local government to maintain. Buyouts that are carried out as part of an overall management system where entire neighborhoods or contiguous parcels are purchased have a greater chance of achieving long-lasting hazard avoidance benefits.

Despite these criticisms, the overall assessment of acquisition as a mitigation tactic is exceedingly favorable. As more and more local governments become familiar with mitigation as a long-term venture, the "snaggletooth" problem may diminish over time.

### 2. Hazard Avoidance Through Land Use Regulation

Local governments are authorized under the police power to regulate the use of private property to safeguard the physical environment, to encourage economic development, and to protect the public's health and safety. Planning literature is replete with studies and analyses of the use and effectiveness of local land use management for mitigating the impacts of natural hazards.<sup>27</sup> Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth are determinants of local vulnerability to natural hazards. Among the most effective land use tools to control growth and reduce vulnerability at the local level are zoning and subdivision ordinances.

*Zoning* is the traditional and nearly ubiquitous tool available to local governments to control the use of land. Some communities have made good use of their zoning ordi-

24. See HAZARD MITIGATION SUCCESSES, *supra* note 21.

25. This is particularly true for repetitive loss properties, defined by the NFIP as any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period since 1978.

26. Aside from the political expediency of refraining from eminent domain proceedings to acquire privately owned hazardous lands, federal sources of funds such as the Hazard Mitigation Grant Program (HMGP) are available only when the sale is voluntary.

27. For an annotated bibliography of selected research on this topic, see Burby, *supra* note 6, app.

nances for mitigation purposes by delineating hazard areas on the local zoning map. The corresponding text of the ordinance may designate these areas for low-intensity uses such as recreation, open space, conservation, or agriculture. Zoning can also be used to prohibit environmentally hazardous uses, such as junkyards and chemical storage facilities in areas vulnerable to flooding or earthquake. A zoning ordinance may encourage development in safe areas, by allowing greater density in hazard-free zones.

When a community uses the local zoning ordinance as a hazard mitigation tool, the phrasing of its nonconforming use provisions is critical. The rules must be very clear as to whether or not reconstruction will be allowed if buildings are severely damaged or destroyed by a storm or other natural hazard event. Some states have enacted legislation that prohibits restoration in high-hazard zones if damage is assessed at more than 50 percent of a structure's pre-storm value.<sup>28</sup> Local governments can anticipate similar scenarios through their nonconforming use regulations, establishing standards in advance that restrict rebuilding in identified risk zones.

In addition to the power to regulate land within the urban limits, a municipality's zoning authority covers its extraterritorial planning jurisdiction—an area surrounding the community for up to three miles. This extended authority enables local governments to impose use restrictions on hazard-prone land that lies outside, but contiguous to the city limits. The power to zone in a larger geographic area can control the impacts of natural hazards that have their genesis outside the city limits. For instance, development that takes place outside the municipal boundaries may increase flood risks to urban areas downstream. The power to zone in the extraterritorial jurisdiction can provide a way to control the density of upstream development to mitigate the impact of flooding within the community proper.

*Subdivision ordinances* control land that is being divided into parcels for sale by establishing standards for infrastructure and lot layout. Subdivision regulations are used to prevent new construction on land that is not suitable for development, and to ensure that infrastructure is provided to adequately support the development. In terms of their effectiveness for hazard mitigation purposes, studies have shown that subdivision controls, although more widely used than zoning, are not well tied to hazard mitigation aims.<sup>29</sup> However, the opportunity to reduce vulnerability can be realized with a well thought out subdivision ordinance that requires careful consideration of the specific topography of proposed development sites during the regulatory review process.

Both functional standards and performance standards contained in subdivision ordinances can be used to require mitigation of natural hazards. Regulations can require that storm drainage facilities are planned as an integral part of the development, with systems designed to minimize the possibility of soil erosion, siltation, and flooding. Lots can be situated so that drainage is always away from buildings

through the use of natural topography. Flood-prone areas should be identified and kept free from development, and setback distances should be established along waterways.<sup>30</sup> Subdivision ordinances can also incorporate regulations that restrict the amount and type of impervious surfaces used by developers. Such limitations can control the volume and rate of stormwater runoff in urbanized areas.

If a lot within a subdivision is not suitable for development—because, for instance, it is located in a flood fringe area, near the urban-wildland interface, over an aquifer recharge area, or where there are unstable soil conditions—the local government and the developer can often negotiate alternative designs that preserve the environment while allowing the development to go forward.<sup>31</sup> One such alternative is to cluster homes to greater densities outside the hazard-prone portion of the subdivision, and to dedicate the unbuildable lots to open space or other low-intensity use.

### 3. Hazard Avoidance Through Local Spending Policies

The power to spend municipal funds can strengthen community resilience when spending is carried out as part of a comprehensive public facility and land management policy that includes hazard mitigation as a specific purpose. When making decisions about expenditures for new facilities such as schools, fire stations, sewer treatment plants and other public necessities, local governments can choose to locate these critical facilities in areas with lowered risk of damage from natural hazards. Careful siting can protect lifelines during a disaster, reduce public outlays for repair, and minimize the time and expense for reconstruction following a hazard event. Local governments can also use capital improvement and maintenance programs to prescribe standards for the design and construction of new public facilities with hazard mitigation components, or to retrofit existing public structures. Although many local communities nationwide have taken a proactive approach to safeguarding publicly owned structures, there is a persistent disincentive to protect critical facilities from natural hazards because the damage costs are typically passed on to the federal government through various disaster assistance programs.<sup>32</sup>

In addition to locational and construction policies aimed at limiting damage to public structures, local governments can also use their spending power to discourage private development in hazardous areas, while directing new growth to designated nonhazard areas. By limiting the availability of public services such as roads, schools, utility lines, and other supporting infrastructure, the municipality can steer development appropriately. However, studies indicate that jurisdictions tend to ignore their own capital programs, and that policies designed to locate public facilities outside of hazard areas to discourage growth do not alter the basic spatial pattern of development.<sup>33</sup> Furthermore, capital improvement programs are generally ineffective for controlling development in communities that have already reached build-out, or where private developers are able to provide the infrastructure necessary to support new construction. In

28. Under the North Carolina Coastal Area Management Act, a permit to rebuild following a hurricane or other coastal storm is required if the cost of repairing damage to a structure is greater than 50% of the physical value of the structure itself. Construction must meet all regulations in effect at the time of rebuilding, including oceanfront setback requirements.

29. Robert B. Olshansky & Jack D. Kartez, *Managing Land Use to Build Resilience*, in Burby, *supra* note 6 [hereinafter Olshansky & Kartez].

30. DAVID LISTOKEN & CAROLE WALKER, *THE SUBDIVISION AND SITE PLAN HANDBOOK* (Rutgers Center for Urban Policy Research 1989).

31. *Id.*

32. See Olshansky & Kartez, *supra* note 29.

33. *Id.*

the rare instances that capital spending policies have been used for hazard mitigation purposes, their effectiveness has depended upon linkages with other local land use measures working in concert toward comprehensive growth management goals.<sup>34</sup>

#### 4. Hazard Avoidance Through Local Taxation and Fee Policies

The power of taxation can have a profound impact on the pattern of development in a community. By assessing differential tax rates in certain districts, the local government can influence which lands are relatively affordable to develop. The community can then direct growth to desirable, safe areas, while providing disincentives for developers to build on lands identified as hazardous. Many communities use differential taxation to encourage conservation of ecologically significant land, or to support property owners who use their land for agricultural purposes. There is comparatively less documentation of using the practice to accomplish natural hazard mitigation objectives, even though the legal authority to do so exists in many jurisdictions.

While few communities use their real property taxation policies to manipulate land use patterns for mitigation purposes, local governments have made use of other types of tax incentives to influence design and construction practices. Tax abatements can encourage homeowners and developers to integrate mitigation measures into new structures and to retrofit existing properties, much like tax credits and allowances have been used to encourage the construction of energy efficient homes and office buildings. Tax incentives have been applied to storm proofing, flood proofing, wind strengthening, and seismic retrofitting, among other hardening construction techniques. Tax abatements can also take the form of permit fee waivers for structures built with mitigation features, or discounted construction fees for retrofitting. Waivers of sales taxes on building materials to strengthen or retrofit homes and businesses have also been used as incentive for mitigation. The village of South Holland, Illinois, has a rebate program to help property owners fund retrofitting projects to protect against surface and subsurface flooding. If a project is approved, installed, and inspected, the village will reimburse the owner 25% of the cost up to \$2500. About 650 flood-proofing and sewer backup protection projects have been completed under the program. Perhaps not surprisingly, local contractors have become some of the best agents to publicize the program.<sup>35</sup>

Impact fees and special assessments are often levied against property owners to more equitably distribute the financial burden of development to those who directly benefit. Special assessments can be used for mitigation purposes to raise revenue for specific improvements, such as a flood retention pond, or to fund ongoing services such as maintenance of stormwater management systems. These charges do not usually discourage development in the assessment district, but they do transfer some of the cost of living or doing business in a hazard-prone area to those who choose to do so. Despite the potential to distribute risk-related costs, studies show that local governments have little interest in

charging hazard-based impact fees or special assessments, even when public facilities are damaged in the course of serving at-risk areas. Communities have preferred to purchase insurance against losses rather than pass the cost of service along to developers and residents.<sup>36</sup>

#### C. Property Protection

In a perfect world, communities would be built in locations that are never exposed to the impacts of natural hazards. Hazard avoidance, however, is an impractical approach to mitigation in areas where development is warranted on economic grounds,<sup>37</sup> where hazard risk is uniformly experienced across the jurisdiction,<sup>38</sup> or where the hazard area itself is integral to the community's identity.<sup>39</sup> In these places, the most appropriate strategy to reduce potential disaster losses is to strengthen buildings and facilities so that they are able to withstand hazard impacts.

Property protection involves physical or structural measures applied to individual buildings and facilities to make them more resilient to identified hazard impacts. From extensive studies of properties that have sustained damage in past disasters, many of the features that can contribute to damage are now known, and include among other factors: at-grade construction; poor framing; inadequate anchoring; insufficient piling depth; marginal materials; and poor workmanship. Strengthening measures to combat these deficits include elevation, flood proofing, nonstructural mitigation, seismic retrofitting, and enforcement of rigorous building codes. Training and education of professionals that have direct roles in siting, design, and construction of new buildings is also critical to successful property protection. Permit officials, inspectors, builders, architects, engineers, material suppliers, as well as housing consumers and other property owners should be well versed in the types of measures that can strengthen structures, often at relatively low cost when incorporated into the design and construction of new buildings.

*Elevation* is one of the most widely used property protection techniques and has successfully reduced future flood losses while keeping neighborhoods intact in communities nationwide. Elevation involves raising the lowest habitable floor above the 100-year or base flood elevation (BFE). Alternatively, elevation entails raising critical components of a

36. *Id.*

37. See Burby, *supra* note 6.

38. "Avoidance is the preferable approach, but sustainable communities recognize that some exposure is inevitable (for example, wind forces from hurricanes and coastal storms, which in Florida and other coastal states are unavoidable)." Timothy Beatley, *The Vision of Sustainable Communities*, in Burby, *supra* note 6, at 243 [hereinafter Beatley].

39. The town of Princeville, North Carolina, incorporated in 1885 by former slaves, illustrates the pride of place that many small town residents take in their communities. The floodwaters brought by Hurricane Floyd in 1999 caused severe damage to a majority of the houses in Princeville. Despite the extensive damage, homeowners in the town chose not to participate in the buyout offer made by the state to fund the acquisition of the damaged homes, which would have enabled the citizens to move to higher ground. Instead, the residents of Princeville, believing that their sense of place could not be replicated elsewhere, decided to employ other mitigation measures. The town strengthened the levee against the banks of the Tar River that had broken during the flood, and protected existing structures through elevation and flood-proofing techniques, thus keeping the town intact for future generations. See NATURAL HAZARDS MITIGATION PLAN, *supra* note 1.

34. *Id.*

35. FEMA, REDUCING DAMAGE FROM LOCALIZED FLOODING: A GUIDE FOR COMMUNITIES (2005) (FEMA Pub. No. 511).

building above expected flood levels, including, for example, the HVAC, electrical circuitry or other systems that can be damaged by contact with water. Elevation-in-place can be a viable alternative for certain public facilities such as wastewater treatment plants, lift/pump stations, water storage facilities, and other public buildings that cannot be located at another site.<sup>40</sup>

*Flood-proofing* techniques can provide protection to certain types of buildings. Although the NFIP does not allow flood proofing of new residential structures because of the potential catastrophic nature of damage if flood-proofing measures fail, it is a reasonable mitigation tool for some other types of buildings. Nonresidential buildings can be constructed to withstand anticipated flood forces, and in some instances, older buildings can be retrofitted with flood-proof materials. Although flood proofing can increase construction costs, it may be the only way to reduce damage when no other alternative is available.<sup>41</sup>

*Seismic retrofit programs* can be cost-effective approaches to reducing earthquake vulnerability. The objective is to make buildings and infrastructure resistant to the effects of ground shaking and liquefaction. Both structural and nonstructural retrofit techniques can be adopted to minimize casualties and reduce damages. Low-cost techniques include securing suspended ceilings, bolting bookcases to the walls, or fastening heavy equipment like computers to prevent injury to occupants during earthquake tremors. While these techniques are well accepted in recognized earthquake risk zones, the challenge has been to make seismic preparedness and retrofitting a higher public priority in moderate-risk communities.<sup>42</sup>

Although incentives, education, and training for property owners and building industry professionals can encourage integration of protection measures during the construction phase, the most effective way to promote structural mitigation is through the creation, implementation, and enforcement of *building codes* that reflect adequate standards of protection for specific hazard risks.

A few states have enacted mandatory statewide building codes; in these states, local governments are not authorized to develop building codes of their own. Yet even in these states, local governments are usually responsible for enforcement of the state code, and can ensure that the code is rigorously applied. Enforcement of the building code is crucial if it is to be effective at protecting structures against natural hazards. Lax enforcement can place people at risk of injury or death during a severe hazard event.<sup>43</sup>

Strict compliance with the letter as well as the spirit of the building code is especially critical in the aftermath of a disaster. It is understandable that residents and property owners want to rebuild their homes and businesses as quickly as possible following a hurricane or other large-scale event. There is often considerable political pressure on building officials in the post-disaster environment to expedite or cir-

cumvent the permitting process. However, the urge to return to normalcy must not be indulged at the sacrifice of public health and safety. Nor should the rebuilding process take place so quickly that valuable mitigation opportunities are lost.

Some local jurisdictions have moratoria that can be activated during a state of emergency following a natural hazard event. Moratoria provide local officials the time needed to assess the extent of site-specific hazard impacts, and to re-map high-hazard areas to reflect actual damages. Moratoria can also help local decisionmakers set priorities for response and long term recovery efforts and to consider mitigation measures to reduce the risk of future disasters. Moratoria are often used to prevent property owners from rebuilding damaged structures before an acquisition program can be put in motion, or to activate new regulations for elevation and other property protection measures.

The town of Nags Head, located on the hurricane-prone Outer Banks of North Carolina, has building moratoria of various lengths that can be activated following a disaster. An initial, 48-hour moratorium goes into effect immediately. Replacement of destroyed structures is halted for 30 days. In the meantime, planners and the Board of Commissioners may adjust the zoning code to reflect new inlets or eroded areas or to incorporate mitigation standards. All replacement construction must comply with the new ordinances established during the 30-day moratorium. Building permits issued prior to the storm are revoked for at least 30 days. These moratoria have proved useful to local officials in the post-disaster phase to restructure the regulatory regime according to damage actually sustained and newly identified hazard risks.<sup>44</sup>

#### D. Environmental Preservation

Termed “ecological infrastructure and natural capital” by noted planning researcher and author Timothy Beatley,<sup>45</sup> a community’s wetlands, hillsides, shorelines, floodplains, riparian areas, forests, and habitats can provide important and cost-effective natural services and benefits, not the least of which is hazard mitigation. “A sustainability approach to natural hazards understands that frequently the most effective way to reduce vulnerability of people and property is to preserve a healthy, well-functioning ecosystem.”<sup>46</sup>

Many communities have initiatives to protect and manage these critical ecosystems. Soil conservation and steep slope preservation measures typically place restrictions on the grading of hillsides and prohibit development on landslide-prone slopes. Oceanfront setbacks establish a minimum distance between the existing shoreline and the buildable portion of a lot. Dune preservation laws help protect development against storm surge flooding by restricting pedestrian and vehicular access, and by prohibiting the leveling or lowering of dunes for visual access. Wetland protection and restoration can be effective for stormwater management and floodwater retention. These and other measures are implemented through regulation, acquisition, incentives

40. *See id.*

41. *See* NATURAL HAZARDS MITIGATION PLAN, *supra* note 1.

42. *See* HAZARD MITIGATION SUCCESSES, *supra* note 21.

43. For instance, studies of damage caused by Hurricane Andrew in 1992 attributed one-quarter of the storm’s total damages to “shoddy workmanship and poor enforcement of the building codes.” DAVID R. GODSCHALK ET AL., MAKING MITIGATION WORK: RECASTING NATURAL HAZARDS PLANNING AND IMPLEMENTATION 49 (Island Press 1999).

44. DAVID J. BROWER ET AL., A PLAN TO MAKE NAGS HEAD, NORTH CAROLINA, LESS VULNERABLE TO THE IMPACTS OF NATURAL HAZARDS (1990).

45. *See* BEATLEY & MANNING, *supra* note 3.

46. *See* Beatley, *supra* note 38, at 245.

for private landowners, or partnerships with nonprofit conservation and land trust agencies.

The effectiveness of environmental protection measures for hazard mitigation purposes varies widely, but in general, these measures are most successful when used in concert with state and federal management programs. This is particularly true for the protection of wetlands, which are highly regulated by the state and federal governments. Few, if any environmental protection regulations purposely prevent development patterns that are vulnerable to natural hazards, particularly when mitigation is not among the stated regulatory goals. However, hazard mitigation is often a side benefit that can be realized through complementary programs aimed at recreation, transportation, water quality, or aesthetic objectives.

### E. Education and Outreach

The key to an effective, long-term initiative that instills a “mitigation ethic” often depends on community consciousness. As citizens, public officials, planners, developers, builders, emergency managers, and school children learn about the nature and consequences of hazards, they can also learn about the steps that can be taken to minimize injuries, damage and economic losses. An array of innovative approaches to foster community support for hazard mitigation and disaster preparedness is available to local governments intent on generating a well-informed citizenry.<sup>47</sup> Hazard mapping, disclosure laws, disaster warning, and public awareness campaigns are some of the more commonly used measures to disseminate information to citizens about their hazard risks.

*Hazard maps* are an invaluable educational tool and are often made available to the public as a strikingly visual way to present information about risk. Hazard mapping has become increasingly sophisticated through the use of GIS, which supports the inventory and display of spatial data related to the location and characteristics of hazardous areas. Layers of data that graphically demonstrate vulnerability include local demographics, property values, land cover, topography, and other features of the built and natural environments. These layers can be overlaid with data on hazard-related factors such as flood heights, fault lines, storm surge inundation areas, and landslide zones for a complete picture of populations and assets at risk. The power of maps cannot be underestimated when they clearly demonstrate areas of the community that are most vulnerable. When home and business owners see that their properties are located in areas mapped as hazardous, they may be more likely to support mitigation actions and policies. When elected officials are shown how much of the local tax base is located in hazardous areas, they too may be more willing and eager to implement mitigation measures to reduce the likelihood that valuable property will be damaged or destroyed by a disaster.

Hazard maps can also be used to define the boundaries within which hazards must be *disclosed* during real estate transactions, although these rules are more often issued at the state rather than the local level. California, for example, has an earthquake hazard disclosure requirement tied to real estate transactions in designated active fault zones. Massa-

chusetts has proposed a similar requirement for property subject to coastal hazards.<sup>48</sup> Local real estate boards can make notification effective by requiring that newcomers be advised about hazard risks early in the home-buying process. Real estate boards may also require sellers to disclose past disaster events, regardless of whether the property is in a mapped high-risk zone.<sup>49</sup>

While all forms of hazard education can raise the level of awareness of community residents, *disaster warnings* are critical for saving lives in emergency situations involving flash floods, tornadoes, and other rapid onset hazards. Warning systems connected to stream gauges, for instance, can prevent accidental drowning of residents in areas where flood heights increase dramatically in a very short time. Warning systems associated with dams and levees can also facilitate rapid evacuation in the event of a dam break. Automated warning systems, often carried out through reverse 9-1-1 telephone connections or multi-tone siren broadcasts, have also been used to warn residents of imminent threats. Signage is used in some communities to provide information about how to recognize and what to do in the event of tornadoes, blizzards, lightening storms, rock slides, avalanches, and rip-tides. Warning is an integral feature of a local preparedness strategy, particularly in communities that are experiencing significant increases in population growth and seasonal influxes of tourists and visitors.

Although many people fail to respond to emergency warnings of imminent disaster, even fewer residents heed warnings that are projected further into the future. “Some people are not able to accurately perceive probabilities of loss, even when they have been told a hazard exists. As a result, they tend to heavily discount any benefits from avoiding a hazard or taking action to reduce vulnerability.”<sup>50</sup>

While communities cannot single-handedly change a fatalistic outlook or combat all of the psychological factors that lead people to ignore warnings and cautionary notices, *education and outreach campaigns* can help eliminate some of the misconceptions and confusion regarding natural hazard risks in the region. Some communities have been successful in increasing awareness of the location of hazards and associated risks through workshops, Internet sites, brochures, expos, fairs, and other creative methods to reach public officials, the business community, residents, and visitors. For instance, during the 1999 hurricane season, New Hanover County in coastal North Carolina distributed hurricane-tracking maps that allowed users to trace the paths of hurricanes as they crossed the Atlantic Ocean. The user-friendly maps, accompanied by information regarding household preparedness and mitigation strategies, proved very popular, and helped increase awareness of the number of hurricanes that make landfall or come close to the state’s coast each year.

### III. Financing Local Mitigation Strategies

Local elected officials must balance many competing interests when allocating limited local resources. Highly visible problems, such as roads, schools, housing, and health care

47. See HAZARD MITIGATION SUCCESSES, *supra* note 21.

48. Robert E. Deyle et al., *Hazard Assessment: The Factual Basis for Planning and Mitigation*, in Burby, *supra* note 6.

49. See TOOLS AND TECHNIQUES, *supra* note 7.

50. See Burby, *supra* note 6.

often grab the immediate attention of constituents. During periods of economic downturn, high unemployment, and restricted federal aid, local government coffers are strained while the need for government services increases. However, many local governing boards have come to realize that money invested in hazard mitigation activities can protect the community's tax base, saving millions of dollars in property damage by reducing losses from inevitable natural hazards.<sup>51</sup> The economic value of mitigation is particularly evident in communities that have carried out acquisition projects involving repetitive flood structures. Although the initial outlays are steep, it has proven to be a cost-effective strategy over the long term to remove families from flood-hazard properties. Keeping businesses open, residents in their homes, and basic services operating following an emergency results in economic security and social stability for local communities.

State and federal aid is a large part of many local governments' revenue stream. Grants and other aid programs help local governments meet specific needs, including emergency preparedness, disaster recovery, and hazard mitigation. States that experience multiple disaster declarations have been able to funnel money to local governments to carry out large mitigation projects, such as massive buyouts of repetitively flooded structures and elevations of homes in entire neighborhoods.

While outside sources of funding pay for the bulk of large-scale mitigation projects, many creative local governments are becoming more self-reliant when it comes to financing mitigation activities. Local governments have used capital improvement funding, taxes and special assessments, utility fees, municipal bonds, regulatory fees, and other methods of raising revenue to pay for mitigation. Local governments can also assign portions of their annual budgets to incorporate mitigation measures into existing and on-going programs. Often, funds for operations and staff time can be reallocated, or procedures and policies can be altered to infuse a mitigation sensitivity without additional expenditures. In addition, many boards and commissions that oversee or manage hazard mitigation programs are voluntary, backed by budgeted staff support. Some of the most effective mitigation strategies may require no additional money at all, just a shift in thinking, particularly with regard to land use planning and growth management. Various creative methods of resource generation and allocation have been quite effective in some progressive communities to find "new" money to implement hazard mitigation strategies.

#### IV. Pulling It All Together: Local Government Planning

Numerous studies have indicated the need for an integrated approach to hazard mitigation that is orchestrated via local

planning efforts.<sup>52</sup> It is clear that local government powers of regulation, acquisition, taxation, spending, and education are used to their best advantage in the context of planning. The integration of hazard mitigation with land use planning and management has been touted as one of the most effective methods of creating more sustainable communities.<sup>53</sup>

Whether undertaken as part of a comprehensive land use plan, or created as a stand-alone document, hazard mitigation planning at its best can be an effective vehicle for establishing the community's commitment to mitigation goals. By articulating what the community hopes to achieve, the plan can serve as an important connection between the public interest and the implementation of mitigation measures. A mitigation plan can help a local community avoid the uncoordinated and often inconsistent results of an ad hoc, project-by-project attempt to reduce risk.<sup>54</sup> While some mitigation techniques are more applicable than others, the combination of several strategies in one cohesive program is often more effective than a single-shot attempt. A mix-and-match approach that samples from the whole smorgasbord of mitigation tools can best be achieved through the planning process.

The primary purpose of hazard mitigation planning is to identify community policies, actions, and tools for implementation over the long term that reduce risk and lower the potential for future losses. This is accomplished by using a systematic process made up of sequential steps: learning about the hazards that can affect the community; setting clear goals; identifying appropriate actions; following through with effective mitigation strategy; continuing to monitor community vulnerability; and keeping the plan current. Hazard mitigation planning is most successful when it increases public and political support for mitigation programs, results in actions that also support other important community goals and objectives, and influences the community's decisionmaking to incorporate hazard reduction into all facets of government activity.<sup>55</sup> One of the most significant catalysts for the creation of local hazard mitigation plans is found in the DMA, as we describe in the second half of this Article.

#### V. Hazard Mitigation Planning Under the DMA

##### *A. The Role of State and Federal Governments in Building Community Resilience*

While local governments may be the foot soldiers of mitigation, they are certainly not the only level of government with a stake in increasing hazard resilience. Nor are local governments alone in carrying out policies and actions that influence the patterns of growth and development that in large part determine community vulnerability. In some instances, the role of higher levels of government is a negative one; federal and state governments carry out many policies that

51. "A fundamental premise of mitigation strategy is that current dollars invested in mitigation will significantly reduce the demand for future dollars by reducing the amount needed for emergency response, recovery and reconstruction following a disaster." DEPARTMENT OF CITY & REGIONAL PLANNING, UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, KEEPING NATURAL HAZARDS FROM BECOMING DISASTERS: A MITIGATION PLANNING GUIDEBOOK FOR LOCAL GOVERNMENTS 2 (2003) [hereinafter MITIGATION PLANNING GUIDEBOOK].

52. "It has been demonstrated time after time that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster actually occurs." FEMA, STATE AND LOCAL MITIGATION PLANNING HOW-TO GUIDE: GETTING STARTED: BUILDING SUPPORT FOR MITIGATION PLANNING (2002) (FEMA 386-1) [hereinafter FEMA 386-1].

53. David R. Godschalk et al., *Integrating Hazard Mitigation and Local Land Use Planning*, in Burby, *supra* note 6.

54. See MITIGATION PLANNING GUIDEBOOK, *supra* note 51.

55. See FEMA 386-1, *supra* note 52.

are outside the realm of local control and which can severely affect a community's development patterns.<sup>56</sup> These de facto management policies may have unintended consequences for hazardous areas, and may even exacerbate hazard risk.<sup>57</sup>

On the other hand, state and federal agencies can also provide affirmative encouragement for local governments to engage in mitigation. Such prodding can be in the form of carrots (usually money) or sticks (such as unfunded or underfunded mandates, or restrictions on eligibility for certain funding streams). One such push involves state mandates for local planning; at the federal level, the push comes from conditioning the receipt of mitigation funds on the development of local hazard mitigation plans.

### *B. State Mandates for Local Land Use Planning*

Studies have shown that communities are more likely to manage land use to mitigate the impacts of natural hazards in states that mandate planning, especially when such mandates specifically require that hazard mitigation be included in local land use plans. However, many states have no such mandate. In these states, the quality of local plans varies widely in terms of their effectiveness for managing development to reduce hazard risks.<sup>58</sup> Some states, such as North Carolina, only require that certain regions of the state engage in planning. Under the North Carolina Coastal Area Management Act, the 20 counties that make up the coastal zone are required to create land use plans, a component of which must address hazard threats and emergency evacuation. There is no legislative planning mandate for the remaining 80 counties of North Carolina, despite the fact that much of the state is subject to serious flooding and other natural hazards.

### *C. Federal Mitigation Planning Mandate: The DMA*

Impetus for local hazard mitigation planning also comes from the federal level, most directly through the DMA.<sup>59</sup> At the outset, §322 of the DMA promised to be a major catalyst for local mitigation planning by issuing new requirements for state, local, and tribal plans. The language of the DMA reinforces the importance of mitigation to reduce di-

saster losses, and emphasizes planning for disasters before they occur.<sup>60</sup>

According to §322, local governments are required to create DMA-compliant plans in order to be eligible for post-disaster project grants, i.e., "bricks and mortar" grants, under the HMGP for all disasters declared after November 1, 2004.<sup>61</sup> This is significant, because HMGP dollars represent an enormous source of funding for local communities to carry out projects to mitigate the impact of future disasters while the window of opportunity following a disaster is open. Communities must also have an approved plan in place to be eligible to apply for PDM project funds that are available through §203 of the DMA.<sup>62</sup> While PDM grants are only issued once a year through a competitive application process, they are very important to local governments for mitigation funding purposes, especially since PDM grants are available without the necessity of a disaster declaration.

In addition to funds for mitigation projects, certain other disaster assistance funds will be withheld from local governments that do not comply with the DMA planning requirements. Expenses will not be reimbursed for the repair and restoration of publicly owned facilities that are damaged during a disaster if a local government does not have an approved plan in place. While some exceptions apply, e.g., emergency debris removal, significant expenditures will fall solely to states and local governments if the DMA criteria are not met in a timely fashion.

#### 1. Planning Criteria Under the DMA

The rules that accompany the DMA set forth a rigorous planning process that states and local governments must follow. Regulatory criteria divide the planning process into five sections: (1) Prerequisite; (2) Documentation; (3) Risk Assessment; (4) Mitigation Strategy; and (5) Plan Maintenance. These criteria represent the minimum standards for a local hazard mitigation plan to receive a score of "satisfactory" from FEMA.<sup>63</sup>

##### *Prerequisite:*

- Adoption by the local governing body, including each governing body represented in a multi-jurisdictional plan

##### *Planning Process:*

- Documentation of the planning process
  - Opportunity for public comment
  - Involvement of neighboring communities, local, and regional agencies, agencies that regulate development, business, academia, and non-profit interests

56. "Many factors that affect the use of hazard mitigation measures are beyond the control of local government." See Olshansky & Kartez, *supra* note 29, at 184.

57. For example, the Internal Revenue Code includes provisions that offer tax credits, deductions, and other forms of subsidies that can have a profound effect on development in hazard areas such as the coastal zone. DAVID J. BROWER ET AL., COASTAL HAZARDS MANAGEMENT INSTRUCTOR'S GUIDE (2006).

58. See, e.g., RAYMOND J. BURBY ET AL., MAKING GOVERNMENTS PLAN: STATE EXPERIMENTS IN MANAGING LAND USE (Johns Hopkins Univ. Press 1997); PETER H. MAY ET AL., ENVIRONMENTAL MANAGEMENT AND GOVERNANCE: INTERGOVERNMENTAL APPROACHES TO HAZARDS AND SUSTAINABILITY (Routledge Press 1996); Philip R. Berke et al., *Enhancing Plan Quality: Evaluating the Role of State Planning Mandates for Natural Hazards Mitigation*, 17 J. ENVTL. PLAN. & MGMT. 178-99 (1996); Philip R. Berke & Steven P. French, *The Influence of State Planning Mandates on Local Plan Quality*, 13 J. PLAN. EDUC. & RES. 237-50 (1994); Raymond J. Burby & Linda C. Dalton, *Plans Can Matter! The Role of Land Use Plans and State Planning Mandates in Limiting Development of Hazardous Areas*, 54 PUB. ADMIN. REV. 229-38 (1994), among other studies.

59. Pub. L. No. 106-390 (amending the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Pub. L. No. 93-288, as amended by Pub. L. No. 100-707).

60. See FEMA 386-1, *supra* note 52.

61. A community without a plan may still apply for planning grants under the 7% of HMGP funds available for planning. For disasters declared before November 1, 2004, a community without a plan can apply for and receive HMGP project grants, but must commit to developing the plan while implementing the project. 44 C.F.R. §201.6(a)(1) (2002).

62. Note that communities without an approved plan may still apply for Pre-Disaster Mitigation (PDM) funding for plan development, but must have an approved plan in order to receive PDM project grants. *Id.* §201.6(a)(2).

63. For these criteria, see *id.* §201.

—Description of the planning process

*Risk Assessment:*

- Identification of hazards
  - Description of the type of all natural hazards that can affect the jurisdiction
- Profile of hazard events
  - Description of the location and extent of all natural hazards that can affect the jurisdiction
  - Previous occurrences
  - Probability of future hazard events
- Vulnerability assessment
  - Structure inventory
  - Loss estimate
  - Development analysis
- Multi-jurisdictional risk assessments
  - Separate risk assessment for each jurisdiction

*Mitigation Strategy:*

- Capability assessment
  - Local authorities, policies, programs, and resources
- Local hazard mitigation goals
- Identification and analysis of mitigation measures
  - Identification and evaluation of mitigation actions or projects; emphasis on new and existing buildings and infrastructure
- Implementation of mitigation measures
  - Prioritization, implementation, and administration of strategies
  - Cost-benefit review

*Plan Maintenance Process:*

- Monitoring, evaluation, and update
  - Method and schedule within a five-year cycle
  - Plan must be reviewed, and revised, if appropriate, by the local jurisdiction, by the State Hazard Mitigation Officer, and by FEMA
- Incorporation into existing planning mechanisms
  - Description of how plan will be incorporated into other plans, including comprehensive or capital improvement plans, when appropriate
- Continued public involvement

These minimum criteria can result in a solid mitigation plan, so long as the process is carried out carefully and thoughtfully, and the community is attentive to creating a plan that reflects local conditions. The rules provide flexibility for creative adaptation, and local governments are not constrained by the planning process from developing innovative approaches to reducing community vulnerability.

## 2. A Lack of Implementation Requirements

While the DMA outlines a comprehensive procedure for assessing hazard risks and developing mitigation goals and strategies, a major flaw in the legislation is the dearth of implementation requirements. As the DMA is written, if a local government produces a plan that meets all the criteria, is submitted by the regulatory deadlines, is reviewed by its state, and is approved by the FEMA regional office, then that community is considered eligible to receive federal disaster

assistance and hazard mitigation grant funds. The minimum criteria do include a section on prioritization and implementation; however, local governments are not required to do more than describe and list their proposed implementation methodology. There is no mandate to actively pursue the implementation measures described in the plan. In other words, by writing, adopting, and submitting the plan, the local community meets all regulatory requirements and will receive a passing mark of “satisfactory” for its plan.<sup>64</sup>

On the other hand, although there are no overt implementation requirements written into the regulations, the process of developing a DMA-compliant mitigation plan has merit in and of itself. In some communities, the planning process has helped increase local awareness of hazard risks and established the need for mitigation action. Furthermore, the planning process can help forge new relationships, such as interdepartmental liaisons within a single community, or partnerships among communities that have participated in a multi-jurisdictional plan. Local communities have also developed strong relationships with their state emergency management offices; the give-and-take process of technical assistance and data sharing that often takes place over the course of local plan development can create lasting paths of communication between the state and local levels. Relationships that are developed during normal operating times can prove invaluable during an actual emergency or disaster, when situations unfold quickly and established lines of communication are essential.

## 3. Assessing the DMA in Practice

Despite its weak implementation requirements, the DMA has the potential to encourage innovative and creative approaches to hazard mitigation planning. The question that must be asked then is: “Has the DMA prompted the creation of *quality* mitigation plans by local governments?” We hesitate to make gross generalizations based on the review of local plans that do not represent all 10 FEMA regions nationwide, but according to an initial evaluation of a few selected jurisdictions, it would appear that the majority of local plans prepared under the DMA are below par in terms of their long-range outlook to bring about enduring reductions in hazard vulnerability. The legislation itself provides unlimited opportunity for communities to develop policy-oriented mitigation plans that are uniquely tailored to meet local conditions. Yet many of the plans submitted thus far have been mere bureaucratic exercises, rather than creative changes to land use patterns and development trends that might increase community resiliency.

In this section we will discuss some of the shortcomings of the DMA that have come to light as local hazard mitigation plans are submitted and reviewed. Drawbacks to the DMA that we will briefly consider here include: (1) local reaction to the Act as an unfunded mandate; (2) the perception of the DMA as overly burdensome in terms of the breadth and scope of plan content that is expected of local governments; (3) the disconnect between the disciplines of emer-

64. We could perhaps soften this criticism by acknowledging that the states are encouraged, if not required, to oversee the local planning process from start to finish, including its subsequent implementation. However, there are no consequences imposed for not implementing a local plan, and state oversight is essentially meaningless if the local community is unable or unwilling to put its plan to work.

agency management and planning as exhibited in local plans produced thus far; (4) problems of timing in the issuance of official rules and guidance; and (5) a lack of quality control measures at the reviewing stage to facilitate a better end product.

a. Local Resistance to DMA Planning Requirements: The Perception of the DMA as an Unfunded Mandate

Local governments are accustomed to receiving unfunded or underfunded mandates to carry out numerous services for their citizens. Familiarity, however, does not necessarily breed contentment. Many local communities bristle when faced with what they perceive as overreaching demands placed upon them by state or local government. In several states, local reaction to the planning requirements imposed by the DMA has been one of resentment, even antipathy. These local communities have failed to recognize the connection between the benefit to be received (eligibility to receive hazard mitigation and other disaster-related funds at a later, undetermined date) and the burden imposed upon them (the development of a full-scale hazard mitigation plan). Many of these communities consider it onerous to develop a plan with the level of detail and analysis stipulated in the Act. Compounding the feelings of resentment is the fact that up until very recently, eligibility to receive mitigation and assistance funds depended on merely surviving a disaster.<sup>65</sup>

The root of the perception of the DMA as an unfunded mandate may lie in the way that federal disaster assistance, including mitigation, has historically been issued. The literature often characterizes the popular opinion of disaster assistance as an “entitlement.”<sup>66</sup> Numerous studies indicate that local governments (and state governments as well) have been willing to do little to mitigate the impacts of natural hazards, because it was assumed the federal government would bail them out should a disaster occur.<sup>67</sup> Certainly, when the capacity of state and local governments is overwhelmed, the federal government ought to provide support; in large-scale events, the level of damage legitimately warrants federal assistance following a disaster declaration. Yet even following less-than-catastrophic disaster events, it has traditionally been assumed that state and local governments would easily receive full compensation for losses, along with a percentage

65. This resentment may be especially severe in states where there are no statewide land use planning or growth management policies, and where the decision to manage land use and development is largely left to individual municipalities and counties. On the positive side, despite the fact that planning in some states is not mandated for the local level, many local jurisdictions throughout the country are or will soon be DMA-compliant, although perhaps begrudgingly so. See, e.g., Mitigation Division, FEMA, *About the Mitigation Division*, <http://www.fema.gov/about/division/mitigation/mitigation.shtm> (last modified Feb. 5, 2007) (this website lists all approved local hazard mitigation plans to date).

66. “[A]uthors have identified obstacles to improving the implementation of mitigation, including the perception of disaster assistance as a social entitlement . . .” GODSHALK ET AL., *supra* note 43, at 17 (internal citations omitted).

67. “The ready availability of federal funds may actually contribute to disaster losses by reducing incentives for hazard mitigation and preparedness.” RUTHERFORD H. PLATT, *DISASTERS AND DEMOCRACY: THE POLITICS OF EXTREME NATURAL EVENTS* (Island Press 1999) (quoting NATIONAL PERFORMANCE REVIEW, *CREATING A GOVERNMENT THAT WORKS BETTER AND COSTS LESS: FEDERAL EMERGENCY MANAGEMENT AGENCY* (1993) (Gov’t Printing Office Pub. No. 13)).

of funds specifically for mitigation purposes, without having to account for the level of risk that perpetuated the disaster, nor having to reduce the risk so that the potential for future disasters is minimized. With enactment of the DMA, however, these expectations are no longer automatically fulfilled; state and local governments are now required to earn their disaster dollars by developing and adopting a hazard mitigation plan that meets legislatively dictated criteria.

It is interesting to note that the perception of the DMA as an unfunded mandate is not grounded in reality for many local governments. Planning grants are made readily available under the DMA on a competitive basis prior to a disaster: §203 of the DMA establishes a “National Pre-Disaster Mitigation Fund” that helps state and local governments comply with the statute, including completion of a hazard mitigation plan. Furthermore, in states that have experienced large disasters in the past, funds from the post-disaster HMGP are often available to local governments to create local mitigation plans. Not only can communities located in the declared counties benefit from HMGP funding, once HMGP funds are issued to a state following a declared disaster the money can be funneled to any community in the state, whether located within or outside the disaster declaration area.<sup>68</sup> Yet despite the ready availability of financial assistance to create hazard mitigation plans from various funding sources, the common perception is that the DMA forces local governments to comply with excessively rigorous planning demands and that they must rely on their own resources to do so.

b. The All-Hazards Approach: Demanding Too Much Too Soon

A sound mitigation plan must be based on a thorough and careful assessment of risk.<sup>69</sup> The risk assessment portion of a hazard mitigation plan provides the foundation for the rest of the mitigation planning process, answering the fundamental question: “What would happen if a natural hazard event occurred in the community?”<sup>70</sup> The answer to this question—discovered over the course of identifying and profiling hazards, assessing community vulnerability, and estimating losses—should be the driving force behind the creation of mitigation goals, strategies, and actions.<sup>71</sup>

Few professionals in the planning field would disagree that a careful risk assessment is a prerequisite for a good

68. For instance, North Carolina has had abundant HMGP funds at its disposal because it has experienced numerous floods, hurricanes, and ice storms over the past several years. The North Carolina Division of Emergency Management has made shrewd use of these funds, distributing sizable planning grants to communities throughout the state to facilitate compliance with the DMA. As a result, North Carolina has one of the highest rates of approved local hazard mitigation plans in the nation.

69. “Sustainable land use cannot be achieved for hazardous areas when decision making is not adequately informed about risk.” Robert E. Deyle et al., *Hazard Assessment: The Factual Basis for Planning and Mitigation*, in Burby, *supra* note 6, at 120.

70. FEMA, *STATE AND LOCAL MITIGATION PLANNING HOW-TO GUIDE: UNDERSTANDING YOUR RISKS* (2001) (FEMA 386-2) [hereinafter FEMA 386-2]. In the language of the implementing rules of the DMA, a “risk assessment . . . provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards.” 44 C.F.R. §201.6(c)(2).

71. “Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.” *Id.* §201.6(c)(2).

mitigation plan; however, some local governments have expressed resistance to the DMA because they feel the Act requires too much too soon in terms of hazard assessment. Granted, the DMA is a very ambitious piece of legislation, and the regulations call for a lengthy and complex planning process.<sup>72</sup> What is particularly burdensome to some local governments is the requirement for a thorough analysis of *all* the hazards facing the community.<sup>73</sup> There is no requirement that the hazards be prioritized or ranked in importance at this initial identification stage, leaving the local government to cast the net far and wide in order to cover every potentiality, including those hazards that do not necessarily pose a significant threat to the community. Not only must the local government identify all potential natural hazards, it must also provide a description of the type, location, and extent of all the hazards identified, as well as information on previous occurrences and the probability of future hazard events.<sup>74</sup>

In addition to this detailed hazard identification and profiling, the risk assessment must also contain a description of the community's vulnerability to the hazards identified, including an overall summary of each hazard and its impact on the community.<sup>75</sup> The plan should also (but is not required to) describe vulnerability in terms of "the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas"<sup>76</sup>; "an estimate of the potential dollar losses to vulnerable structures"<sup>77</sup>; and "a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions."<sup>78</sup>

The required all-hazards approach is laudable in theory, and can be successful in practice when plans are developed over a considerable length of time, allowing for thorough information-gathering and analysis to be performed. Under the DMA, however, local communities were scrambling to meet a statutorily imposed deadline of November 1, 2004, and the requirement that the local plans cover every possible hazard proved to be an overwhelming task for many local communities. The sheer number of hazards to be included in the identification step, coupled with the level of detail required or recommended in terms of profiling and vulnerability assessment, has resulted in perfunctory (albeit bulky) analysis in some plans. Instead of conducting a thorough assessment of the highest priority hazards, communities have been expected to embrace the all-hazards approach immediately, an assignment for which many local governments were ill-prepared.<sup>79</sup>

If, in contrast, local governments are allowed to focus their energy and resources on a few chosen hazards, such as

the top three hazards in terms of probability, magnitude, and impact, they could perform a comprehensive analysis of those few. The local government, with assistance from the state, will be able to identify these more obvious hazards with relative ease. Most states have the capacity to identify the most significant hazards at the state level, and can work with the locals to tailor the hazard list to meet locally specific conditions. Some localities will have additional information at their disposal regarding their unique hazard risks. This, in turn, can help the states integrate the local plans into the state plan, a requirement imposed upon states by the DMA.<sup>80</sup>

### c. A Disconnect Between Emergency Management and Mitigation Planning

The fulcrum of the planning effort under the DMA lies largely with emergency management, not with planning.<sup>81</sup> At the local level, the slant towards emergency management and away from planning is particularly pronounced. While FEMA and most state emergency management agencies have trained planners on staff to administer the DMA, this is not standard practice at the local level. Large numbers of local hazard mitigation plans are being created through the county or municipal emergency management office; professional planners, if they are involved at all, are often relegated to the periphery of the planning process. A number of local plans submitted under the DMA have been glorified emergency operations plans (EOPs). While EOPs are critical to a community's preparedness, response and recovery operations, an EOP is not the equivalent of a mitigation plan. Furthermore, a typical EOP by its very nature does not address land use, building standards, or future growth and development—elements that are fundamental to a comprehensive mitigation plan. An EOP that is massaged to fit the DMA criteria cannot meet the full potential of what a hazard mitigation plan under the Act could be.

We are not asserting that planners have an exclusive claim on hazard mitigation planning—there are many professionals trained in disciplines other than planning who are fully qualified and competent to produce a DMA-compliant local mitigation plan. However, planners, through virtue of their training, may approach the task with a frame of mind more attuned to the nuances of the process, particularly in terms of land use management and development patterns that are so critical to building resilient communities. While there are many mitigation strategies that can reduce local vulnerability, the single most effective approach involves keeping people and property out of harm's way, an approach that entails regulating current land uses and planning for future growth, activities that fall under the purview of the pro-

72. *Id.* §201.6.

73. Section 201.6(c)(2)(i) states: "[The risk assessment shall include a] description of the type . . . of **all natural hazards** that can affect the jurisdiction" (boldface emphasis added).

74. *Id.*

75. *Id.* §201.6(c)(2)(ii).

76. *Id.* §201.6(c)(2)(ii)(A).

77. *Id.* §201.6(c)(2)(ii)(B).

78. *Id.* §201.6(c)(2)(ii)(C).

79. The FEMA planning how-to guidance for identifying hazards states: "You should look at the full range of potential hazards and assess whether they may affect the area you're including in your mitigation plan. While this might sound daunting, there is a relatively small list of hazards to consider." See FEMA 386-2, *supra* note 70.

80. Because this Article focuses on the hazard mitigation planning experience of local governments under the DMA, we will not discuss further the regulatory requirement for integration of local mitigation plans into the state plan: "[The State Plan must include a] description of the State process and timeframe by which the local plans will be . . . linked to the State Mitigation Plan." See §201.4(c)(4)(ii). We do note that integration is proving difficult for some states, in part because local plans are of insufficient depth or detail to warrant integration of their data and analyses.

81. State offices and agencies of emergency management are housed in various departments within state government, such as: the Office of the Governor (California); the Adjunct General (Tennessee); the Office of Community Affairs (Florida); and the Department of Crime Control and Public Safety (North Carolina).

fessional planner. As the future of the DMA unfolds and the next round of new and updated local plans are developed, emergency managers and planners should work together to produce local hazard mitigation plans that take advantage of the expertise of both specialties, and encompass all aspects of a resilient community.

#### d. Administration of the DMA: A Problem With Timing

Part of the reason the DMA is not living up to its potential may be the way it has been administered to date. Issuance of official rules and criteria was not well timed, nor was the publication of guidance materials from FEMA to assist state and local governments in interpreting and applying the regulations. Delays and multiple revisions caused confusion and frustration on the part of some state and local governments who were struggling to meet statutory deadlines for submission of mitigation plans. In addition, delays in funding to help local communities prepare their plans also caused confusion and backlogs in the development of local plans.

The DMA was signed into law on October 30, 2000. The statute itself establishes the intent of the U.S. Congress and sets forth basic requirements, but contains only a limited description of criteria for compliance. To implement the DMA planning requirements, FEMA published a series of rules in the *Federal Register*, the succession of which was intended to clarify earlier rules, including plan submission deadlines. Final interim rules were published in February 2002, a full 16 months after the law was enacted, with a deadline of November 1, 2003, for plan submission (the deadline was later extended to November 1, 2004). This hurry-up-and-wait approach to the issuance of official criteria had serious implications for local plan quality.

Guidance material to help interpret a law is issued at an administrating agency's discretion, and while this material has no official authority and is not binding upon the agency, it usually offers helpful hints as how to best satisfy the official requirements set by the statute and regulations. Revised how-to guidance material from FEMA to assist state and local governments was issued in March 2004, three and one-half years after the law was enacted.<sup>82</sup> Even less guidance was issued for communities that were participating in multi-jurisdictional plans, with little direction on how to fulfill the rather sparse criteria for joint planning projects.

In addition to the "moving target" that presented itself to states and local governments in the form of changing deadlines and revised guidances, many local governments that were approved for planning grants from FEMA did not receive full or even partial payment for many months. In times

of local budget crises, it is understandable that local officials were reluctant to expend scarce resources on mitigation planning activities without full assurance of imminent reimbursement.<sup>83</sup> As a result, many local planning efforts stalled, and plans were then created hurriedly to meet mandatory deadlines. The quality of some of these plans suffered as a consequence, although most were later approved after a series of reviews and revisions.

#### e. Lack of Quality Control During the Plan Review Process

The majority of local plans that have been submitted under the DMA are perhaps adequate, but are by no means stellar examples of what local hazard mitigation plans *could* be. DMA planning criteria are thorough and complete with respect to the number of elements that must be included in a local hazard mitigation plan, yet no true qualitative measurements are incorporated into the FEMA review process. The criteria themselves are merely quantitative in nature, and the checklists that FEMA regional offices follow during the local mitigation plan review process are just that—checklists. Although many plans are in fact rejected upon their first submittal due to issues of technical accuracy, documentation, or methodology, the qualitative assessment is often cursory; provided each item on the checklist is checked off, approval of the plan is all but guaranteed.

Part of this problem may be due to the substantial emphasis placed on the hazard identification and vulnerability assessment steps—the "background analyses" of the planning process. As a result, many of the local plans that we have examined are quite heavy (literally) in terms of data gathering and recording, and cover every hazard conceivable. Countless communities have conducted complex analyses using the latest GIS technology, and have produced sophisticated maps with multiple data layers and a wealth of information concerning local hazard risks. However, even in those communities where the quality of the background analysis has been exceptional, the plan itself often seems to miss the point: the essential purpose for conducting a risk assessment is to *provide support for the creation and implementation of policy that addresses risk reduction*. It is this critical component—the clear statement of policy change to reduce vulnerability—that is partially, and in some cases even wholly missing from approved local hazard mitigation plans.

We do not mean to infer that local communities are not including hazard mitigation actions in the required strategy section of their mitigation plans. Many of the plans propose a panoply of strategies, often in the form of long wish lists of projects and programs that the community would like to have funded. For the most part, these action ideas are familiar, acceptable mitigation measures that are politically palatable and easy to implement. We can conjecture about the rationale behind the hesitation to promulgate policies that may limit growth in the most hazard-prone areas of the jurisdiction: voter pressure; opposition from property owners; limited resources; fear of diminished tax revenues; and residents' mistrust of government interference, among other grounds for doubt. These are legitimate concerns that community leaders must take into account when making decisions that impact the community's pattern of land use. How-

82. It is far from our intent to engage in unmitigated FEMA-bashing in this Article. We note that FEMA did issue an extensive series of mitigation planning how-to guides, with certain of the volumes being made available within a year of the law's enactment. Furthermore, we acknowledge that the DMA represents a departure from the traditional form of disaster-related assistance, and that planning for disasters is a relatively new experience at all levels of government. Following the issuance of interim criteria, FEMA monitored the progress of states, local governments, and tribes as they developed their plans, working in partnership with them to help ensure success. FEMA remains committed to enhancing its guidance products as questions and concerns arise. The updated *Multi-Hazard Mitigation Planning Guidance* issued in March 2004, incorporated state, local, and tribal officials' feedback and addressed issues that were expressed during the rewriting process. See FEMA, MULTI-HAZARD MITIGATION PLANNING GUIDANCE (2004), available at <http://www.fema.gov/fima/guidance.shtm>.

83. See NATURAL HAZARDS MITIGATION PLAN, *supra* note 1.

ever, what is lacking in these plans are thoughtful, innovative, and perhaps controversial mitigation policy statements based on the outcome of the risk assessment and directed towards the local community's future growth and development. These are difficult decisions to make, but these are the decisions that determine vulnerability of the community to the impacts of hazards yet to come.

## VI. The Future of Local Hazard Mitigation Planning Under the DMA

Local governments have both the responsibility and the legal authority to significantly increase community resilience in the face of natural hazards. Under their broad police power, municipalities and counties can control many features of existing development, and can regulate the nature of future development. With this authority comes the responsibility to manage growth so that the community's vulnerability to natural hazards is minimized to the greatest extent practicable.

Creating a resilient community is most effectively achieved through the development, adoption and implementation of a local hazard mitigation plan. The DMA emphasizes the importance of mitigation planning by conditioning the receipt of important federal disaster assistance and mitigation funds on the completion and approval of a mitigation plan that meets criteria in the DMA regulations. We concede that many of the criticisms we have brought against the DMA during this Article may merely reflect the complaints of states and local governments that have endured the arduous process of preparing comprehensive all-hazard mitigation plans to remain eligible for disaster funds. After all, what was once an entitlement must now be earned.

These relatively minor concerns aside, our point regarding plan quality is a much more serious criticism: many of the local mitigation plans prepared under the DMA thus far lack strong policy statements that deal with land use in areas of identified hazard risk. This is unfortunate, because changes in our current approach to growth and development are essential to break the cycle of destruction and rebuilding that is so prevalent in some of the nation's most vulnerable communities.

In 2005, Hurricane Katrina jerked open our eyes and showed us the worst-case scenario in vivid detail. The immense scale and far-reaching consequences of this national disaster will forever be seared in the memories of the television-viewing public. We witnessed unspeakable horrors—sometimes during live coverage—of massive destruction caused by wind, rain, and storm surge. The storm itself was extraordinarily powerful, but it was so utterly devastating because it made landfall in a particularly vulnerable region along the Gulf Coast. The tragic number of human deaths and catastrophic amount of damage was caused in large part by decisions made years earlier to live in, build near, and alter the natural environment in a region exposed to recurring coastal storms.

Who is culpable for the Hurricane Katrina disaster and countless others that have occurred around the nation? That question cannot be easily answered and serves little imme-

diately purpose. A more pertinent question is: how do we proceed from this point forward? By insisting that local hazard mitigation plans prepared under the DMA address issues of land management in a proactive and actionable way, we could begin to reduce the levels of vulnerability that have risen to such extreme heights in so many of our communities over the past few decades.

Community resiliency does not come easily. Difficult decisions must be made regarding the location, density, and quality of new growth, but these decisions must be made with the knowledge that natural disasters do not happen accidentally. It is only when past decisions have placed people and property in the path of natural hazards that disasters occur.

The current atmosphere and heightened awareness of the potential for disaster may provide increased impetus for the creation of more local mitigation plans. This presents an opportunity that should not be missed. The legislation is in place and the DMA regulations offer a uniform framework for basic mitigation planning. By incorporating more stringent qualitative measures into the DMA plan review process, states together with their FEMA counterparts can begin to steer local communities in the direction of safer building patterns. Local control over land use decisions would not be restricted, rather, DMA plans could serve as a vehicle for creating more resilient communities through sound land use planning that takes hazards into account.

Despite the grievances expressed over the burdensome nature of the DMA planning requirements, and despite the lack of quality in plans produced thus far, there is much in the DMA to praise. Indeed, hundreds of local plans have been submitted nationwide for FEMA approval as a prerequisite to receiving federal pre- and post-disaster assistance and hazard mitigation funds. Many of these plans have been submitted by communities that in all likelihood would never have created a mitigation plan without the impetus provided by the Act. All 50 states have been approved for a standard hazard mitigation plan by their respective FEMA regional offices, as have 7 territories, the District of Columbia, 6 Native American Indian Tribes, and hundreds of local jurisdictions.<sup>84</sup> These states and communities are to be commended for entering the largely uncharted territory of hazard mitigation planning.

While the majority of local hazard mitigation plans that have been submitted to date may not be models of creativity and innovation, we must remember an essential principle of planning: planning is a process. Plans are meant to be dynamic and evolutionary, and should reflect changing conditions and circumstances as they occur. Through the incremental process of updating and modifying state and local plans,<sup>85</sup> we can hope to see improvement with each iteration. As obstacles are minimized, local governments can realize the opportunities for increasing hazard resilience under the DMA.

84. FEMA, *FEMA-Approved Multi-Hazard Mitigation Plans*, <http://www.fema.gov/plan/mitplanning/applans.shtm> (last modified July 27, 2006).

85. Updates of local plans are required every five years, or after each disaster under the DMA. States must update their hazard mitigation plans every three years.