

Chapter 4

The Planning Process

Chapter 3 reviewed the underlying public purposes of planning for post-disaster recovery and reconstruction. This chapter will move beyond that discussion to examine the steps a community should follow in preparing such a plan, based in large part on the experiences of a number of communities that have already done such planning. (See the sidebar on the next page for an overview of these steps.)

In the United States, the centerpiece of planning efforts has long been the comprehensive plan. The individual elements included in local comprehensive plans have varied significantly in response to both community needs and state planning mandates, although certain staples, such as transportation, community facilities, and land use, are nearly universal. In addition, various kinds of jurisdictions have evolved specialized plans to address particular needs, such as inner-city redevelopment, the cleanup of environmentally contaminated areas, or the expansion of public parks and recreation facilities. The previous chapter covered the need for strategic linkages between the plan for post-disaster recovery and reconstruction and these other plans or plan elements. In some communities, post-disaster plans themselves have been devised as independent, or stand-alone, special plans. In either case, plans or comprehensive plan elements addressing the need for post-disaster recovery and reconstruction represent one more way for planners to help their communities cope with a defined problem and to shape a vision of how the community can improve its situation and take advantage of opportunities for positive change (Berke, Kartez, and Wenger 1994).

Importantly, this section will not consider those issues that are largely addressed by emergency managers in their own operational plans for disaster response. Rather, it will be limited to those that affect the long-term reconstruction of the community. The more operational emergency management issues may well find a place in an actual post-disaster plan, but that integration needs to be developed through local cooperation between planners and emergency management officials. Where the latter set of issues intersects both categories, the emphasis will be on their implications for long-term reconstruction.

FORMING A TASK FORCE

The plan for post-disaster recovery and reconstruction must tap a uniquely broad combination of resources and expertise in order to reflect the complex realities that must be addressed. An interdisciplinary reconstruction planning task force is the best way to guide the process of constructing the plan. This allows the interagency task force that must implement the plan to have a hand in guiding its creation. In relatively small communities, however, the staff may be able to develop the plan with less formalized public and

Steps in the Planning Process

Below is a simple chronological outline of the steps described in this chapter for initiating and completing the process of preparing a plan for post-disaster recovery and reconstruction:

1. **Make the decision to plan** for post-disaster recovery and reconstruction
2. **Form a task force** to develop the plan
3. **Put someone (some agency) in charge** of the process
4. **Document the hazards and risks** for your community
5. **Present your findings** to the community and get feedback
 - a. Develop clear, effective educational materials
 - b. Hold public forums to discuss the problem
6. **Build public consensus** around the need to develop and implement a plan
7. **Develop the plan**
 - a. Prepare plan elements as needed
 - b. Link the plan to other plans
 - c. Link the plan to land-use regulations
8. **Present the plan for adoption**
 - a. Hold public hearings
 - b. Get the legislative body and chief executive to adopt the plan
9. **Implement the plan**
 - a. Set pre-disaster elements in motion
 - b. When disaster strikes, be ready to act
10. **Review and amend plan as appropriate**
 - a. On periodic basis
 - b. When planning laws change
 - c. After disasters

interagency input, but citizen participation in the plan's development will remain essential for building public consensus. The sidebar on page 78 lists the composition of the post-disaster planning task force proposed in a Key West, Florida, ordinance that was awaiting city council action as this document was being completed, as well as an existing intergovernmental task force in Escambia County, Florida.

These task forces have taken different names and forms depending on the nature of the hazards being addressed. In many communities, for instance, a floodplain management plan task force would suffice. In Los Angeles, on the other hand, the multiplicity of natural hazards present necessitates a multihazard perspective that accounts for wildfires, mudslides, floods, and earthquakes. Regardless of the specific circumstances, the plan is more likely to succeed if a broad range of stakeholders has worked on its development. This is particularly true when hazard mitigation can serve some additional planning objectives in the bargain.

Organizing appropriate representation on the task force is as important in this case as with any other interdisciplinary planning effort. The sidebar on page 80 suggests a number of the key players from local government sectors whose representation is likely to be at least essential if not mandatory for success. Two considerations enter into the process: whose participation is essential in guaranteeing technical accuracy and thoroughness for the plan?, and whose participation and support will enhance its political acceptability? With regard to the first question, the input involves issues of both hazard mitigation and emergency management. Those involved in mitigation activities will bring to the process their professional knowledge of both the structural and land-use implications of attempting to minimize or eliminate dangers to life and property from natural hazards. These players include planners and zoning administrators, environmental specialists, and building inspectors. Emergency management perspectives will come from a combination of both emergency managers themselves and allied public safety forces, such as fire and police departments, who can help identify issues like the feasibility of evacuation and shelter plans. Beyond these players, various other local government personnel whose functions either aid or are affected by the post-disaster plan should be involved as is locally appropriate. Common candidates would be transportation and economic development personnel.

In soliciting public input and building public support for the plan, the topics of the next section of this chapter, it is wise to involve some nongovernmental representatives in the task force. Nonprofit service delivery agencies often have a major stake in the plan, considering the resources they often are called upon to deploy in the aftermath of a disaster. Neighborhood and civic organizations representing the most hazard-prone areas of the community may be better able to sell components of the plan affecting those areas to their members if they have been part of the process and learned along the way what stakes are involved in ensuring the plan's success. The chamber of commerce and other business organizations can play a major role not only in selling the plan to the local business community but in providing important perspectives on the challenges involved in facilitating economic recovery. Religious institutions often provide volunteers, shelter, and food in disaster situations and probably deserve a role in helping devise the means of reducing the severity of the crisis beforehand. Environmental organizations can lend support for the multiobjective benefits of sound floodplain management. All of these constituents of the community have played a role in some task force somewhere, but the right mixture for any one community will depend on its history, local politics, the nature and extent of its natural hazards, and the resources needed.

Launching the Post-Disaster Planning Process: Three Case Studies

What launches the process of planning for post-disaster recovery and reconstruction in a community? Much like death, which they sometimes bring in their wake, natural disasters are a subject people often don't want to discuss. It is human nature to try to deny the inevitable, even when we know better. Preparing for the consequences of natural disasters thus becomes a subject shunted into a corner where a handful of professionals, such as emergency managers and fire chiefs, can tend to such nasty business.

The reality, however, is that disasters are everyone's business, a fact that becomes abundantly clear when they strike. Like other less threatening aspects of city planning, they should therefore be the subject of considerable public scrutiny and of a planning process that involves a wide cross-section of the public. Soliciting public input in public hearings on the plan is one way to accomplish that, but it is just as important to construct a process that involves a variety of public and private-sector representatives from the outset in order to guarantee adequate consideration of all the relevant issues. The result will be a plan in which the vast majority of the community, whether or not people are comfortable with peering into the mouth of the beast, feel a sense of ownership of the decisions that resulted. It is vitally important that the plan enjoy wide enough support to ensure its implementation.

Case studies presented on pages 84, 87, and 88 describe how three jurisdictions of widely varying sizes handled the problem of initiating the planning process and of managing public involvement to produce positive results. All three have had their post-disaster plan in place for several years, allowing some perspective concerning their achievements. The case studies are based on both the documentary materials and the plans themselves, as well as telephone interviews with local planners.

Gaining an effective mix of representation can be a prelude to some creative cross-breeding of perspectives in the planning process over the long term. This is important because the disaster recovery plan, once created, will need to evolve over time and respond to new circumstances. In this respect, Lee County, Florida, offers a worthy example of a jurisdiction where, over nearly two decades, emergency management concerns have been steadily integrated into the development approval process. For instance, David Saniter (1998), the county's emergency programs manager, reported that effective intervention by his department helped induce a change in design for a planned hockey stadium to make it possible to use the facility for an emergency public shelter, should the need arise. Such advocacy within the planning process has raised local awareness of the problem, he says, to a level where developers and their attorneys now call him regularly to find out what sorts of shelter space are needed and to discuss what they can offer.

In a sense, Saniter is unusual in that he brought three years of planning experience to his emergency management job when he arrived 17 years ago. But it is not necessary to have people who combine both types of professional experience. Planners can play a significant role in introducing land-use planning concerns to the thinking of local emergency managers, just as Saniter has introduced emergency management concerns into land-use planning. This type of awareness and cooperation in planning for post-disaster recovery does not come easily. The first step on the long road to such a cultural change in resident and developer perspectives on planning for post-disaster reconstruction is to ensure that, at a minimum, planners and emergency managers are exchanging their concerns on the plan development task force, preferably with other vital players involved from the start as well.

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Task Force Composition in Escambia County and Key West, Florida

As is stressed elsewhere in this chapter, no one formula for constructing a post-disaster planning task force is ideal for all communities and jurisdictions. The suggestions offered in this report are all generic in nature, subject to adaptation to local politics and circumstances. That said, examples never hurt.

The first example below is a description of the composition of the Intergovernmental Recovery Task Force prescribed in the *Post-Disaster Redevelopment Plan* of Escambia County, Florida (1995). It should be considered in light of the fact that Escambia County has just one major city: Pensacola. The remainder of the county is unincorporated. The plan envisions a simple structure in which the task force is “created to provide opportunities for cooperation between local governments during pre-disaster planning and post-disaster mitigation analysis and redevelopment.” In other words, it serves double duty as a plan development task force and in managing post-disaster redevelopment, although the latter duties must wait upon activation by the board of county commissioners asking the governor to declare the county a disaster area. The designated chairperson is the county administrator.

The following text is from the plan:

COMPOSITION OF RECOVERY TASK FORCE

The Recovery Task Force will be composed of the individuals (or their designees) that reflect a broad-based representation of community interests and shall be appointed annually by the Board of County Commissioners. The Recovery Task Force shall consist of, but not be limited to, the following individuals:

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| <ol style="list-style-type: none"> 1. County Administrator 2. County Special Projects Director 3. County Attorney 4. County Emergency Preparedness Director 5. County Solid Waste Director 6. County Neighborhood Services Director 7. County Public Works Director 8. County Medical Director 9. County Utilities Authority Director 10. County Neighborhood Improvement Chief 11. County Budget and Finance Chief 12. County Building Safety Chief 13. County Growth Management Director 14. County Planning and Zoning Chief 15. Santa Rosa Island Authority General Manager | <p>Ex officios:</p> <ol style="list-style-type: none"> 1. Representatives of the business community (appointed by the Chamber of Commerce) 2. City of Pensacola Liaison 3. City of Gulf Breeze Liaison 4. Santa Rosa County Liaison 5. County Sheriff Liaison 6. County School District Liaison 7. Northwest Florida Regional Planning Commission Liaison 8. Santa Rosa Island Authority Liaison 9. Other representatives as appointed by the Board of County Commissioners or the Recovery Task Force (i.e., Home Builders Association, League of Women Voters, etc.) |
|--|--|

The county followed the major provisions of the plan in the aftermath of Hurricane Georges, which hit the Gulf Coast on September 28, 1998. These provisions include dealing with operational issues like debris cleanup, damage assessment, and reconstruction policy. At this writing, the activation of the local interagency task force had not occurred.

(continued)

Escambia County and Key West, Florida (continued)

Key West, unlike Escambia County, is a single municipal jurisdiction in Monroe County, an archipelago jutting into the Caribbean that comprises the southernmost part of the state. In August 1997, the consulting firm of Solin and Associates drafted a post-disaster recovery and redevelopment ordinance that will be revised prior to sending it to the city council for adoption. It provided for a redevelopment task force that would meet within 90 days of adoption to “establish a regular schedule of meetings to determine a management framework for resolving issues confronted in times of disaster.” Its proposed duties are typical of those discussed elsewhere in this chapter, and its composition would be as follows:

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| a. City Manager | j. Director of Transportation |
| b. City Attorney | k. Finance Director |
| c. City Planner | l. Director of Florida Keys Aqueduct Authority |
| d. City Emergency Operations Coordinator | m. Monroe County Liaison |
| e. Chief Building Official | n. School Board Liaison |
| f. Fire Chief | o. Tourism Office Liaison |
| g. Chief of Police | p. Red Cross Representative |
| h. Director of Public Works | q. Liaisons to Private Utilities (Telephone, Cable, and Natural Gas) |
| i. Director of City Electric System | |

In this draft ordinance, the city manager would be the designated chairperson of the task force, and the city planner would serve as the vice-chairperson. As a result of following the operational aspects of the recovery ordinance, the city will be reviewing portions of it. The size of the redevelopment task force and the need for a planner to actually go out on damage assessments (with the chief building official and director of public works) are two particular concerns.

Leading the Charge

Who organizes the task force and ultimately takes responsibility for driving the process is a question central to the success of the entire enterprise. Ideally, this role should fall to the community’s chief executive, whether that be a mayor, city or town manager, or county executive or board president. However, it is not uncommon for this executive official to delegate lead agency responsibility to some other official, such as the planning director. When this happens, it remains important that the chief executive has initiated or at least actively blessed the process and that this surrogate retains the active support of the chief executive. In many cases, particularly in larger jurisdictions, a post-disaster planning effort will bring together representatives of agencies or departments that have not worked together in years. In smaller communities, it is more likely that a good deal of informal interpersonal contact takes place on a regular basis, but it is still vitally important that the lead agency or official in the planning process has the clear support of the mayor or town manager in order to ensure the full cooperation and support of the other participants.

The need for such support may seem less apparent in communities where a state mandate drives the necessity for preparing a post-disaster plan, but that would be an unfortunate perception. Even in Florida, with the strongest mandate in this area and the clearest guidance, plan quality varies widely

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Getting the Right People: Task Force Representation

As suggested in this chapter, two essential participants of a task force would come from agencies involved either hazard mitigation or emergency management activities. The list below suggests specific types of officials who should be involved in post-disaster planning at either a state or local level as well as some typical private-sector participants who have a major stake in the policies and objectives of the plan. Those with a more direct stake in the process are italicized.

1. HAZARD MITIGATION

Local:

- *Environmental officer*
- *Floodplain manager*
- *Building official*
- *Planner/planning director*
- *Zoning administrator*
- *Public works director/city engineer*
- *Parks and recreation (where acquisition is a viable option)*
- *Stormwater management official*
- *Economic development director*
- *Finance officer*
- *Transportation official*
- *Housing department*

Special Districts:

- *Regional planning organization*
- *Regional flood control organization*

State:

- *State hazard mitigation officer*
- *State NFIP coordinator*
- *State planning agency*
- *State insurance commission*
- *State housing/building code agency*
- *Natural resources department*
- *State environmental protection agency*
- *Tourism and economic development agency*
- *Transportation department*

2. EMERGENCY MANAGEMENT

Local

- *Emergency manager*
- *Police chief*
- *Fire and rescue official*

State:

- *Emergency management agency*
- *State police*

3. GENERAL

Local

- *Public information officer*
- *GIS specialist*

State:

- *Public information officer*

4. PRIVATE SECTOR

- *Chamber of commerce*
- *Utility companies*
- *Neighborhood organizations*
- *Homeowners associations*
- *Local religious or charitable organizations*
- *Social service agencies*
- *Red Cross representative (quasi-governmental)*
- *Environmental organizations*
- *Private development agencies*

and executive support for interagency cooperation can make a significant difference in the results achieved. This is also true whether the plan is simply an element of the comprehensive plan, which almost invariably is prepared under the leadership of the planning department, or is a stand-alone plan, sometimes prepared under leadership from emergency management. Because of the extensive interagency cooperation needed to effect successful post-disaster reconstruction, executive leadership remains essential in all circumstances.

Choosing the right leadership for the task force itself will vary with the circumstances and may depend heavily on personal characteristics of potential candidates for this role. French and Associates (1995) suggests a resident

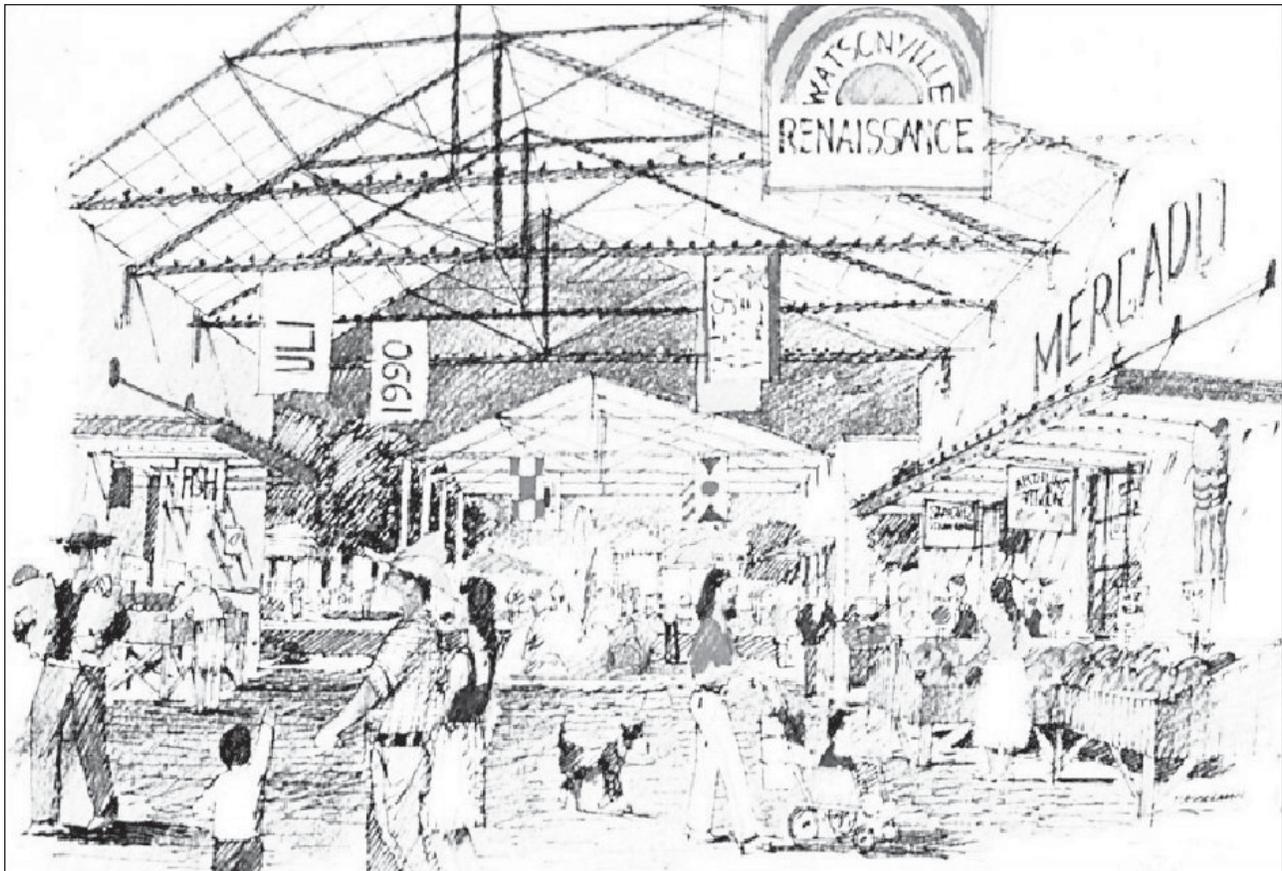
as leader—at least for the flood-related planning efforts that the firm’s guidebook addresses—and that the “planner or other staff member” provide administrative support. This is probably wise, but more important is the qualification that this person have an “ability to get people to work together and get things done.” This should include an ability to pace the work so that neither members’ expectations nor the schedule become unrealistic.

When the Clock Is Ticking

It is generally best that a community initiate the process of developing a disaster recovery and reconstruction plan when no disaster is looming on the horizon and there is ample time to consider the welter of complex issues and interrelationships involved in implementing effective post-disaster reconstruction and mitigation. There are times, however, when it is either apparent that the clock is ticking down to a major disaster or when the disaster strikes in the midst of the planning process. Much less ideally, but frequently, a community is spurred by the aftermath of a disaster to construct a plan virtually overnight. An example of the first instance might involve a northerly or mountainous community that becomes aware that heavy snowmelt and, perhaps, looming ice jams portend a flooding crisis within weeks or months. In heavily forested areas, a prolonged drought often signals the potential for wildfire disaster. The other two possibilities are obvious enough from historical experience. In these cases, executive leadership is essential in determining which steps are most essential in preparing a minimal post-disaster plan with details that will attend to the most important issues at hand, while shortcutting most others. Planners and emergency managers are likely to play some of the most decisive roles in helping to determine what those suitable shortcuts might be.

One shortcut candidate is hazard identification, simply because there may be no time for careful work in this area and much existing information can be marshaled into service in choosing appropriate short-term targets for mitigation efforts. Conversely, it would seem that much immediate emphasis in such circumstances ought to be placed on developing an inventory of funding sources for post-disaster activities that can be tapped efficiently and quickly during the post-disaster period, so that the maximum amount of outside resources can be brought to bear on the problems the jurisdiction has chosen to address.

Despite the necessity of such decisions when these occasions warrant, planners ought not to miss the opportunity to muster support in the disaster aftermath for more substantial planning efforts in the future. Post-disaster crises have nurtured a fair amount of invention in the realm of emergency public participation, notably through the increasingly frequent use of charettes, which typically involve residents, a team of design experts from outside the community, FEMA, and the state emergency management agency in intense efforts to solve problems within a highly compressed time frame. Within 30 days of the March 1, 1997, tornado that devastated Arkadelphia, Arkansas, a four-day recovery planning charette was conducted by a project team composed of planners, urban designers, economists, and engineers. Within another 30 days, the project team and the Disaster Recovery Committee developed a reconstruction strategy that provided a framework for the community’s long-term recovery (Woodward-Clyde 1997a; Schwab 1998). The primary advantage in the post-disaster setting is that the limited time allowed forces everyone involved to focus on essential issues in practical but, hopefully, creative ways. Charettes have played a major role in communities facing either total relocation or massive redevelopment.



This sketch for a rebuilt marketplace was developed during an Urban Land Institute charette held in Watsonville, California, following the 1989 Loma Prieta Earthquake.

French and Associates (1995) suggests five points to consider when dealing with time constraints for preparing a post-flood mitigation plan after the disaster “in order to take advantage of the window of opportunity that the flood has presented and to settle any uncertainties residents may have about their future.” It is noted here that these same points could easily apply to most other post-disaster scenarios.

- Dedicate a person to work on it full time
- Have frequent (e.g., twice per week) planning committee meetings that involve residents
- Do not delay the planning effort in order to obtain detailed data; an adequate plan can be based on generalized information
- Enact a temporary moratorium on reconstruction in areas most likely to be acquired
- Design the plan to address overall issues and make general recommendations (e.g., recommend that additional studies be conducted before finalizing some projects)

As has been said elsewhere in this report, natural disasters are almost invariably cyclical and will happen again. As the Hilton Head Island story (see the sidebar on page 87) suggests, even a near-miss can become the impetus for a more serious public commitment to planning for post-disaster recovery and reconstruction.

Setting the Stage

The goal of this chapter is to review the steps involved in pursuing the development of a plan for post-disaster recovery and reconstruction, including an overview of the process of rallying support behind the very idea of building a more disaster-resistant and sustainable community.

In order to make hazard mitigation and post-disaster recovery and reconstruction a focus of political action, planners must seize strategic opportunities to raise and maintain the profile of natural hazards as a public issue. A major point of this document is that there are specific times in the cycle of natural disasters when people become more receptive to messages concerning change. Once the issue has gained that profile, a crucial component of the planning process is to propose and organize a multiagency task force that will involve all key players in local government in soliciting public input and molding it into a plan of action. (See Chapter 5 for a model ordinance establishing a task force to guide this process.) No group of professionals is likely to be better than planners at orchestrating that process and maintaining its focus on the big picture, so long as elected officials support that orchestration and allow planners the necessary time and resources to do that work.

DEVELOPING COMMUNITY CONSENSUS AND VISION

Requiring implementation in the midst of crisis, a plan for post-disaster recovery and reconstruction is an unusually fragile instrument of public policy. It is unlikely to succeed unless it enjoys broad and knowledgeable support both from the public and within local government. The question is how to build and maintain that support so that it is available to undergird difficult decisions at crucial moments in the aftermath of a disaster.

As a general proposition, the need to build consensus around a vision for the community's future in order to make a plan successful is not a new subject for planners. Since the late 1960s, urban planning literature has contained a profusion of writings concerning techniques and strategies for encouraging citizen participation, enhancing public education about the goals and benefits of planning, and shaping the resulting awareness into agreement on basic public values and objectives (for example, Smith 1979; De Sario and Langton 1987; Moore 1995). Federal, state, regional, and local government agencies have published a host of manuals, studies, and guidelines concerning public participation in planning processes.

The central theme of many of these writings concerns the need to build public awareness that a specific problem exists and that there is a need to solve it through some type of public action. In the view of Innes (1996), the development of these tools for fostering meaningful participation, through what some have called "communicative rationality," has gone far enough to put to rest old criticisms like those of Altshuler (1965) that planners lacked the kind of broad-ranging knowledge needed to prepare a comprehensive plan that retained any validity for decision makers. Instead, they can tap the resources, ideas, and expertise of diverse participants in the planning process, producing a plan that reflects the informed wisdom of the community as a whole.

The process of building consensus has two stages. The first involves building consensus around the very need for a plan in the first place. While this may often be taken for granted in developing comprehensive plans for communities long accustomed to the idea of planning and zoning, it may yet be a necessary step for communities with no historical context for land-use planning. The mere fact that a community is accustomed to zoning does not guarantee that residents will accept new land-use restrictions based on concerns related to hazard mitigation. Planners will likely find a need to build public acceptance of the value of planning for post-disaster recon-

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Launching the Post-Disaster Planning Process: Nags Head, North Carolina

Nags Head is a small town (pop. 1,838) on a barrier island, making it highly vulnerable not only to hurricanes, which strike occasionally, but to steady coastal erosion from northeastern storms every winter and spring. Erosion rates, according to town planner Bruce Bortz, vary from two to 10 feet per year, but are not consistent. A mild winter can slow that rate for a while, but a severe hurricane can escalate the damage dramatically. Moreover, depending on the weather patterns, any given location may receive as much new sand in deposition as another loses to erosion.

In such an environment, it did not take a major disaster to spur Nags Head at least to study the situation. In 1984, the town hired David Brower, a professor of urban planning at the University of North Carolina, as a consultant to prepare a study that examined the value of structures close to the oceanfront and the policies that would be needed to protect such real estate. The study, prepared every five years as part of the town's participation in the federal Coastal Zone Management Program, determined that 40 percent of the town's real estate value was within 300 feet of the ocean.

"Our town council is very proactive about protecting the tax base," Bortz says, "so this study evolved into pretty strong policies on a land-use plan to protect that value and our citizens and structures." Those policies evolved into a post-disaster and mitigation plan, adopted in 1988, that looks at a number of issues ranging from ordinance amendments to development policies. One example that Bortz cites concerns the fate of private roads that wash away in a storm. "We won't expend public funds to replace them," Bortz says, "and we don't allow private roads anymore." The plan has undergone some minor changes since its adoption, and the town is now completing, with Brower, a follow-up study looking at the same property value issues but "with much greater accuracy using GIS." It will examine by value the property directly adjacent to and in floodplains using a series of criteria, with the help of two planning grants to support updating the town's mitigation plan.

One aspect of the development of the plan probably reflects Nags Head's nature as a small town. There was no special task force set up to develop the plan, which was handled by the town's staff in cooperation with the town council and planning board. That does not mean the public had no say in the plan. "One overriding goal that helped in this plan," Bortz says, "was the strong feeling that we wanted to retain the town's family beach atmosphere. That means single-family, low-density, no high-rise hotels. And that helped sell the plan."

It has also been accepted well by the construction community. "It provides a scenario for getting the town back on its feet," he adds. "There are several things that must happen [after a disaster] before a builder can get a building permit, but there is some certainty in the process for builders."

Given the town's early start, it is unsurprising that Bortz sees Nags Head as having driven the development of state requirements under North Carolina's Coastal Area Management Act (CAMA), which requires mitigation plans in 20 coastal counties and their municipalities. "Communities have to develop strong mitigation policies we already addressed in 1985," he notes. CAMA, passed in 1985, "was weak on hurricane mitigation," he says. But new policies, distributed to municipalities in 1990 and 1995 by the Department of the Environment and Natural Resources' Division of Coastal Management, strengthen the original requirements concerning land-use plans. Bortz says they contain a number of ideas that appear to have been borrowed from the Nags Head plan.

struction, particularly where the risk is perceived as distant or infrequent. Gaining acceptance of the need to address natural hazards serves as the prelude to the second stage, that of developing a plan and building consensus around its goals and policies. At this point, the planning process is accepted, and the debate is over the specific goals that will emerge and the means of realizing them. Public involvement should permeate this process, and the best modern tools, such as the Internet and cable television, should be used in combination with direct public contact to maintain and promote an intelligent dialogue on the natural hazards problems the community is

addressing. Keeping the editorial boards of local newspapers apprised of the planning process also helps gain support.

Probably the closest analogy to the type of consensus building involved in planning for natural hazards reduction is the experience of environmental regulators, who often must raise the public awareness of complex scientific and technological questions in order to build support for new policies (Ozawa 1991). Many of the environmental threats that environmental agencies must address are somewhat abstract or confusing to the average citizen, yet the nation as a whole has forged a remarkable consensus behind the need for strong environmental protection. This consensus has held firm despite a wide array of attacks on specific programs and regulations.

Planners will often encounter a certain amount of fatalism in public perceptions of natural hazards. The occasional observation that no place is without its hazards, for instance, is true enough if one cares nothing about probabilities. Here we have the link between the debate over natural hazards policy and that over environmental policy, for in both areas critics repeatedly have noted a need for public education concerning assessments of comparative risk. Despite the technical jargon that surrounds much discussion of risk, planners are in an ideal position to help elevate public awareness of natural hazards. Especially at the local level, they are in a position to mobilize and redirect public concern both before and after natural disasters and to mold it into a lasting base of support for new land-use policies.

The key to success seems partly to involve timing because the essential task in mustering support for a change in policy is that of winning sustained public attention. Historically, advocates of natural hazard risk reduction have not always been noticeably effective. Concerning the growing potential for disaster as a result of new residential development in fire-prone areas of California, for instance, Coleman (1996) notes that an "entire series of reports have been written over the last 35 years, all of which contain essentially the same kinds of concerns and even have amazingly similar recommendations." While some state legislation resulted, the results in terms of adoption and implementation of those recommendations at the local level were far from universal.

How do planners sustain public attention for reducing risk from natural hazards? The experience of cities like Tulsa in developing effective and comprehensive floodplain management strategies suggests that it can be a prolonged process based on nurturing public dissatisfaction with the disastrous results of existing policies and land-use practices (Schwab 1996a). Planners need to accept a crucial but demonstrable paradox. The immediate aftermath of a disaster may not be the ideal time to start constructing a plan for long-term reconstruction because people are anxious to restore normalcy to their lives. However, in most disasters, there is about a 30-day window of opportunity to incorporate a planning framework into the disaster recovery effort. It is also an ideal time to raise awareness that a process needs to be undertaken to reexamine land-use patterns and to plan for the aftermath of future disasters. In the absence of any existing plan for post-disaster recovery and reconstruction then, the immediate aftermath of a disaster is a time for planners to do what they can to mitigate future hazards, to also accept the limits of what they can do under the circumstances, and to look toward fostering an ongoing and probing discussion of how the community will address its vulnerabilities in the future. It is precisely this sense of timing and opportunity that FEMA has been encouraging in local communities as it has strengthened its emphasis on planning for hazard mitigation (FEMA 1990).

As a result, planners should not rule out the possibility of initiating a public discussion of natural hazards in the aftermath of an event. The real

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In the absence of any existing plan for post-disaster recovery and reconstruction then, the immediate aftermath of a disaster is a time for planners to do what they can to mitigate future hazards, to also accept the limits of what they can do under the circumstances, and to look toward fostering an ongoing and probing discussion of how the community will address its vulnerabilities in the future.

point is that the damage from natural disasters is cyclical and will likely spiral upwards with subsequent events as long as the issue remains unaddressed. Thus, it is possible in a city with a floodplain to make clear that even minor, frequent events, such as 10- or 20-year floods, augur much larger disasters unless changes are made.

Some infrequent events, however, provide little in the way of warning. The New Madrid earthquake fault is a classic example of a low-probability, high-risk hazard. It would be folly to wait for this estimated 200-year event before raising public awareness of the need for action. Planners and emergency managers in Missouri, Arkansas, Kentucky, Indiana, Illinois, Alabama, and Tennessee must do what they can to arouse public concern and support for whatever mitigation measures can be developed before a highly uncertain but potentially devastating event ultimately occurs. These steps can serve to minimize the confusion and controversy that will inevitably follow such an event (CUSEC 1993).

Communities that plan for long-term reconstruction have no way of knowing when their plans will be implemented. They can only rest assured that, when that time comes, they will be better prepared than most to make effective use of the available state and federal assistance to emerge from the disaster with a safer, more disaster-resistant community. Without wishing for the worst, their civic leaders at least can know that they will be in an advantageous position to extract a silver lining from future disasters when they occur.

The next section of this chapter will outline the initial task of identifying the hazards that must be the subject of public discussion in this planning process.

HAZARD IDENTIFICATION AND RISK ASSESSMENT

Meaningful local land-use policy cannot address hazards in the abstract. The starting point of the planning process must be an identification of the hazards facing the community and the risks they pose to life and property. FEMA's *National Mitigation Strategy* (1995c) describes hazard identification and risk assessment as "the cornerstones of mitigation," establishing "both a common point of departure and the bounds within which plans and alternatives can be formulated, debated, and decided on." Moreover, empirical research by French et al. (1996) indicates that "high-quality information (hazard data, mapping, interpretation, etc.) would translate reasonably into less damage from earthquakes," and, by extension, for other well-researched hazards as well. An abundance of good information serves to guide the local development market as well as drive local plans and their implementation. A 1997 FEMA document, *Multi-Hazard Identification and Risk Assessment*, is a good initial source for information about the identification of natural and technological hazards and the risks they pose to life and property. Chapter 7 will go into more detail on hazard identification and risk assessment for each of the major natural hazards dealt with in this document.

Three key terms defined in the glossary in Appendix B are worth differentiating here before discussing the process. These are, in the order in which they should be addressed in the planning process, hazard identification, vulnerability assessment, and risk assessment. FEMA (1997b) describes hazard identification as a process of "defining and describing a hazard, including its physical characteristics, magnitude and severity, probability and frequency, causative factors, and locations/areas affected." Assessing vulnerability means taking stock of the degree to which human life and property are exposed to damage from that hazard; in other words, how much damage and loss of life could the

Communities that plan for long-term reconstruction have no way of knowing when their plans will be implemented. They can only rest assured that, when that time comes, they will be better prepared than most to make effective use of the available state and federal assistance to emerge from the disaster with a safer, more disaster-resistant community.

Launching the Post-Disaster Planning Process: Hilton Head Island, South Carolina

Like Nags Head, Hilton Head Island (pop. 24,000) occupies a barrier island along the Atlantic coast, but with a much larger real estate base and population at stake. Compliance with South Carolina's Beachfront Management Act required Hilton Head to develop a plan for post-disaster recovery. However, Hilton Head Island also had a close call that further motivated its planning. When she arrived in 1988, says long-range planner Jill Foster, the town council had budgeted money to draft a post-disaster and mitigation plan, but had never actually done it. But within a month after Hurricane Hugo hit, narrowly missing the town, the council budgeted money to hire The Mitigation Assistance Corporation (TMAC) of Boulder, Colorado, to prepare a plan.

TMAC president Clancy Philipsborn stationed one of his staff members on the island for three months to solicit citizens' input into the plan. The town recruited a planning committee with more than 20 members representing a diverse cross-section of public and private organizations including utility companies, property owner associations, emergency medical crews, the fire department, and the chamber of commerce, among others. The 140-page plan (not counting its extensive appendices) touches on an impressive range of practical post-disaster issues, including troublesome areas like immediate reentry into disaster-affected zones, and entailed coordination with Beaufort County emergency management officials and other public entities and jurisdictions throughout the area. Philipsborn's team and the committee also "went directly to several organizations" for their comments. In all, Foster estimates, about 100 people were directly involved in the plan development process.

Like its neighbor to the north, South Carolina also has special planning legislation affecting coastal areas, in this case its Beachfront Management Act, passed in 1990, which contains a mandate for coastal communities to prepare post-disaster plans. Like the Hilton Head Island plan, the act was largely motivated by the fallout from Hurricane Hugo. But Foster says the Hilton Head Island plan did not result from the act because "the intent to plan preceded the act," although the plan does state that it was prepared under the act's authority. If the Hilton Head Island plan proves anything, it is that good fortune with respect to what could have happened can be as effective in motivating post-disaster planning as being hit by the real thing.

community conceivably suffer? This is differentiated from risk assessment, which focuses on probabilities and is described by FEMA (1997b) as a process for "evaluating risk associated with a specific hazard and defined in terms of probability and frequency of occurrence, magnitude and severity, exposure, and consequences."

Step 1. Identify and Map the Community's Natural Hazards

The first step in hazard identification and risk assessment involves mapping the known natural hazards, a procedure that will vary with the nature of the disaster. By now, every planner in a municipality with a floodplain should know that FEMA for years has developed maps of local flood hazard zones as part of NFIP. These are probably among the most precise guides to the contours of any local natural hazard. However, seismic mapping also exists for earthquakes and volcanic hazards, and storm surge zones have been identified for coastal areas. Tornadoes are by far the most problematic threat because they can occur virtually anywhere given the right atmospheric circumstances. Regardless of these variances, the first step is to document all of them and identify as accurately as possible the areas potentially affected by them.

Step 2. Document and Quantify What's at Risk

The second step in hazard identification and risk assessment is to develop an inventory, to the extent possible, of the built environment that potentially

Launching the Post-Disaster Planning Process: Lee County, Florida

Lee County (pop. 335,000), unlike the towns in the two previous case studies, qualifies as a truly large—and rapidly growing—jurisdiction. Nonetheless, like Hilton Head Island, says David J. Saniter, the county's emergency programs manager, the county used the experience of Hurricane Hugo to motivate the development of its post-disaster ordinance. Although Florida specifically requires a post-coastal storm recovery plan for communities in coastal counties, Saniter also concedes that the quality of and commitment to such planning can vary significantly from one jurisdiction to another (a situation noted by Robert Deyle and Richard Smith in their case study of Hurricane Opal in Chapter 10). Thus, it is not unimportant that he observes that Lee County “expanded upon that plan after Hurricane Andrew,” which “put a scare into people about what could happen in Lee County.”

Lee County is quite possibly the nation's leading example of creative initiatives to inject emergency management concerns into the development approval process as a result of an unrelenting emphasis by Saniter's office on implementation. “We have to fight and fight and fight,” Saniter says of such efforts, “but we started getting things into the comprehensive plan. And at least we discharged our responsibility. We told the county board what would be impacted.” This intervention is unusual, Saniter concedes, noting that in other counties, “my colleagues are scared of planning” and hesitate to intervene in the process to express their concerns. Saniter, however, brought three years of planning experience into his emergency management job when he was hired 17 years ago.

One truly unique implementation device that Saniter doubts can be found anywhere else in the country is the county's All Hazards Protection District, which uses a property tax levy to generate about \$900,000 yearly to fund mitigation measures and emergency public shelters, all with the blessing of the board of county commissioners.

Saniter emphasizes that successful post-disaster planning requires a long-term commitment to the process, but adds that this “learning and educating process” has resulted in support from the development community and its attorneys.

would be affected by these hazards. This inventory not only will indicate the extent of possible damage from the hazard but will also serve as a rough indicator of the threat to human life because people tend to be where transportation or buildings are, and the total or partial collapse of structures or parts of structures is a primary cause of death and injury in a disaster. This potential damage to life and property is what constitutes vulnerability, and the likelihood of that damage—quantifying the probabilities—is what constitutes risk. A flood in an unpopulated and unbuilt area, for example, poses little or no risk. On the other hand, the risk posed by even a modest earthquake in downtown Los Angeles can be quite high. The potential damage from an eruption of Mt. Rainier, located as it is within view of Washington's major metropolitan areas, could easily be catastrophic (Krakauer 1996).

Because predicting the future is strictly a matter of probabilities, the only certain data come from past experience. Thus, planners documenting risk must include in their reports the history of previous natural hazards events, their magnitudes, and an inventory of the human and property damages that occurred. Those magnitudes should be expressed numerically, in a statistical or other mathematical measure, such as the Richter scale (earthquakes), Saffir-Simpson scale (hurricanes), Fujita scale (tornadoes), or flood probabilities (for example, an x -year flood). More detailed explanations of such documentation appear in Chapter 7.

The age of housing stock and other structures can vary significantly within a community. It is no accident that, when a natural disaster strikes,

some parts of town suffer disproportionate losses, including some types of historic properties, older housing that often serves lower-income residents, and older commercial districts that may often lie just outside the central business district. It is important to build into the process, preferably with the use of computerized databases and GIS, a pre-disaster inventory of vulnerable structures and to use this information to evaluate building performance on a geographic basis. This is not just a building department function, though building officials are necessarily involved, because it can also reveal much to planners about needed changes in development patterns for the future.

It is important to realize generally that advances in information management technology are making the automation of these tasks possible at an increasingly rapid rate. A good deal of technical sophistication is now available far less expensively today than ever before, and progress will continue at an exponential rate. In addition, coordination of hazard-related databases and GIS technology can occur at a statewide level through state emergency management agencies. Probably the most promising venture in this regard is underway through the Governor's Office of Emergency Services (OES) in California, which faces possibly the most daunting array of natural hazards anywhere in the nation. Topping (1994) has prepared the agency's GIS strategic plan as a first step in guiding the development of a system that gained considerable value following the Northridge earthquake. A valuable part of the plan discusses strategies for funding this cooperative effort.

Planning agencies often need technical assistance from scientific experts and from state and federal officials in doing a complete hazard inventory and risk analysis for their local plans. Many communities hire outside consultants for this purpose. Chapter 7, which examines hazard identification in greater detail, discusses for each hazard the available resources to which communities can turn for information and advice.

ELEMENTS OF THE POST-DISASTER PLAN

As discussed in the previous chapter, the aftermath of a natural disaster can be an extremely trying period for public officials seeking to restore normalcy to the community and to rebuild. A well-organized plan rooted in good factual detail can make the process manageable and give an appreciative public the sense that someone is in charge and had the foresight to think through the issues and contingencies the community might face during the long process of reconstruction.

Focusing on the details of implementation is at the heart of preparing the elements of the plan for long-term post-disaster reconstruction. Everything matters. The point of this section is to outline briefly the issues that ought to be addressed. Figure 4-1 is a matrix that outlines the various long-term reconstruction policy issues covered in this section and the types of local agencies that would usually be designated with responsibility for that function in a local ordinance, which implements the plan itself. It should be noted that an actual plan will detail many specific implementation measures with agency assignments on a more detailed level than this matrix suggests. Consulting existing plans from other communities is a good way to adapt this level of detail to the precise needs of a particular local government. As these plans usually tend to involve numerous players (depending on the size of the jurisdiction), the watchword in post-disaster planning is cooperation. Planners, however, are in a good position, if supported in this role by the local chief executive, to orchestrate or coordinate the process and to ensure that the plan is a meaningful reference point for all the actors involved.

Focusing on the details of implementation is at the heart of preparing the elements of the plan for long-term post-disaster reconstruction. Everything matters.

As these plans usually tend to involve numerous players (depending on the size of the jurisdiction), the watchword in post-disaster planning is cooperation.

Figure 4-1. Agency Assignments for Post-disaster Recovery and Reconstruction Functions

The chart on the opposite page is intended as a suggestive indication of the local government agencies likely to be assigned to specific action tasks in a municipal post-disaster plan. Agency assignments at a county level obviously would be somewhat different. The list of functions mirrors those in the section of Chapter 4, “Elements of the Post-Disaster Plan,” but is not intended to be exhaustive. Agency designations are intended to be relatively generic, and the overall pattern is distilled from a variety of local plans submitted to APA for this project and does not reflect the experience of any particular jurisdiction. Moreover, in typical plans, the functions listed would often be broken down into specific actions assigned to individual lead agencies; no attempt is made here to be so specific, hence multiple agencies may be listed for single functions.

To clarify the typical roles of planners, five columns have been left with a white background to highlight these functions: building, community development, historic preservation, planning, and redevelopment. Although planners can be found in a wide variety of agencies in local government, these agencies employ the vast majority of planners and are the ones where planners are likely to have some role in the process of preparing and implementing the post-disaster plan. In smaller communities, in particular, planners are most likely to find themselves in combined planning and building departments that handle both building and zoning code enforcement.

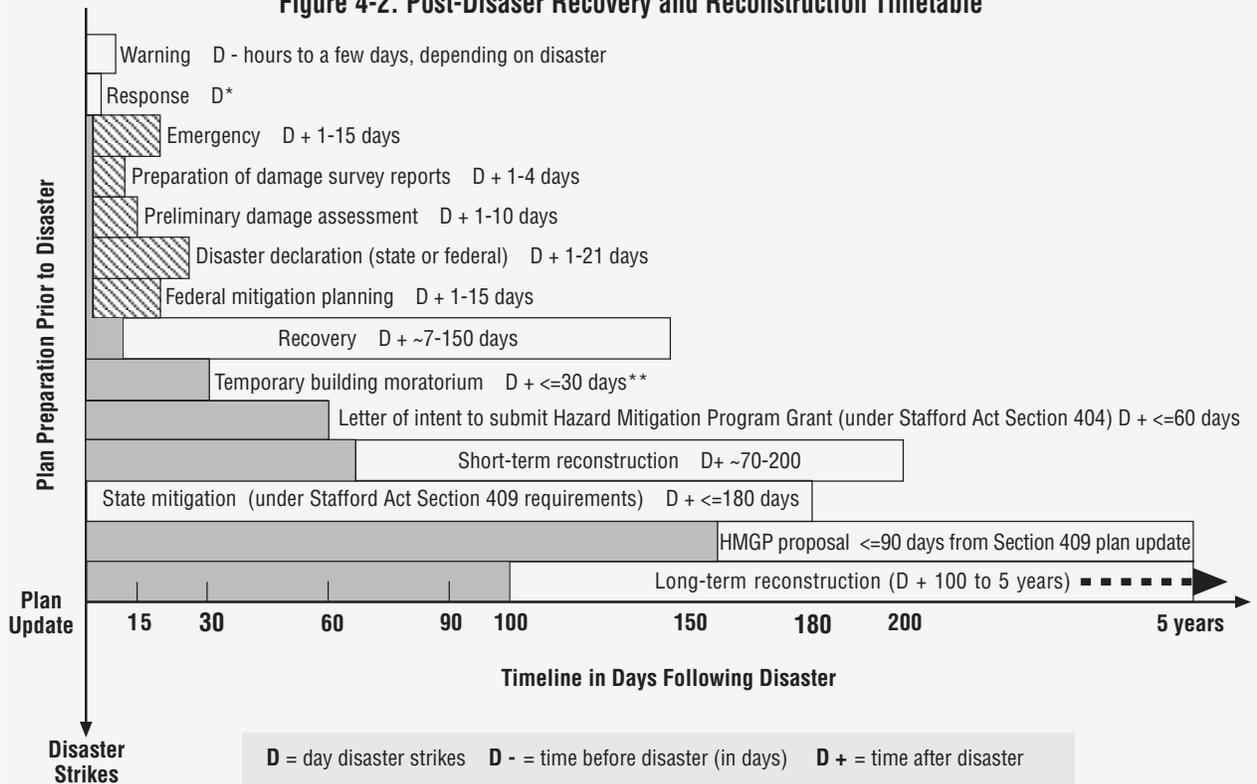
It should also be noted that this chart includes an additional category of functions beyond those listed in this chapter. Response/Early Recovery deals with functions that are implemented immediately during or after the disaster and are addressed in detail largely in the community’s emergency operations plan, a document developed through the local emergency management office. They are listed here to round out the inventory but are not discussed in the text because they are not part of planners’ direct involvement in post-disaster recovery. The exception would primarily be any role planners would play prior to a disaster in identifying appropriate sites for emergency shelters and emergency operations centers.

Key to agency abbreviations in chart:

BF	Budget and finance	HP	Historic preservation commission
BG	Building	PL	Planning and zoning
CA	City attorney	PR	Parks and recreation
CD	Community development	PS	Public safety (police/fire/emergency medical crews)
CM	City manager or mayor	PW	Public works (including publicly owned utilities)
ED	Economic development	RD	Redevelopment agency
EM	Emergency management	SW	Solid waste/sanitation
EN	Environment	TR	Traffic/transportation
HE	Health		
HO	Housing		

FUNCTION	BF	BG	CA	CD	CM	ED	EM	EN	HE	HO	HP	PL	PR	PS	PW	RD	SWTR	
RESPONSE/EARLY RECOVERY																		
Evacuation							X							X				
Urban search and rescue														X				
Emergency shelter provisions							X			X	X							
Mass care (food, water, medicine)							X	X						X				
ORGANIZATION AND AUTHORITY																		
Empower recovery task force			X		X													
Designate lead agency					X													
Operations policy					X													
Set up disaster accounting systems	X				X													
Coordinate with emergency manager					X	X					X							
Public participation and hearings											X					X		
REHABILITATIVE																		
Temporary housing	X		X							X	X					X		
Refuse disposal																		X
Damage assessment	X				X						X							X X
Restoration of utility services															X			
Establish reconstruction priorities					X	X					X	X	X			X		
Reoccupancy permits	X								X		X	X	X					
Emergency demolition	X	X			X													
Emergency permitting	X				X						X							
Loan processing	X		X		X	X				X						X		
Toxic cleanup								X	X						X			X
LAND USE																		
Identify sites for emergency operations											X			X				
Identify new lessons	X						X				X			X				
Compliance with regs. from lessons							X				X					X		
Replanning of stricken areas	X		X					X	X	X	X	X	X	X	X	X		X
Reexamine street patterns for access					X						X	X	X	X	X	X		X
Feasibility of emergency evacuation							X				X	X	X	X				X
Historic preservation	X									X	X					X		
Implement area building moratoria	X	X			X						X							
Reevaluation and update of plan	X		X	X	X	X			X	X	X					X		
REGIONAL COORDINATION																		
Coordination with relief agencies							X											
Temporary housing				X						X	X							
Financial assistance channels	X		X	X	X				X							X		
Transportation repairs/restoration														X			X	X
Emergency legislation		X			X													
Media contact					X													
Mutual aid agreements	X				X									X	X		X	X

Figure 4-2. Post-Disaster Recovery and Reconstruction Timetable



The timeline above is derived from a number of sources, some pertaining to specific types of disasters or jurisdictions. It is intended to be suggestive but not precise, except where statutory requirements apply.

*Response generally refers to those activities undertaken to deal with the immediate crisis as soon after the disaster as it is possible for relief efforts to be mobilized. Often, these may last only a day or two. But in situations where a disaster occurs more than once, as with continuing earthquake aftershocks or prolonged flooding (as occurred in the Midwest in 1993), this response can be stretched to several weeks. Please see Appendix B for definitions of response, recovery, reconstruction, and related terms as used in this document.

**The duration of moratoria generally ought not to be more than 30 days. Often communities will distinguish between very short-term moratoria for permits involving minor repairs (for example, 10 days in Lee County, Florida) and a longer moratorium for more serious repairs or reconstruction of totally destroyed buildings.

Who is in charge? Who reports what to whom? Waiting for a disaster is no way to find out.

Implementation also inevitably involves time lines and sequences. Figure 4-2 delineates the time periods during which various certain essential tasks must or likely will be performed, focusing to some extent on external deadlines that drive the process. The matrix in Figure 4-3 suggests the likely period, using the definitions in the glossary (Appendix B), during which a community would expect to implement the elements of its post-disaster plan.

Organization and Authority

Who is in charge? Who reports what to whom? Waiting for a disaster is no way to find out. As discussed in Chapter 2, the emergency period immediately following a disaster is largely the responsibility of the local and state emergency management agencies and, in a presidentially declared disaster, of FEMA and its partners in the *Federal Response Plan*. Most people are still accustomed to thinking that the story ends there. As this chapter has tried to demonstrate, it is only the beginning of a long period of recovery and

Figure 4-3. Timeline for Post-Disaster Plan Elements

The table below uses the same post-disaster plan elements as those in Figure 4-1 and in the final section of Chapter 3. The intent here, however, is to illustrate roughly the time periods during which the various functions would come into play, allowing for the fact, discussed earlier, that these periods are not fixed in time or even in absolute sequence. Different parts of a community or region may enter more advanced periods earlier than others. Nonetheless, this table may help to give some sense of work flow for communities developing their own plans.

Note: Unshaded boxes with comments are intended to define limited amounts of preparatory work, or, in the case of mutual aid agreements, to indicate a need simply to make operational agreements worked out during the pre-disaster period.

FUNCTION	PREDISASTER	EMERGENCY PERIOD	SHORT-TERM RECOVERY	LONG-TERM RECONSTRUCTION
ORGANIZATION AND AUTHORITY				
Select recovery task force				
Empower recovery task force				
Designate lead agency				
Operations policy				
Set up accounting systems for disaster assistance				
Coordinate with emergency manager				
Public participation and hearings				
REHABILITATIVE				
Temporary housing	Identify sites			
Refuse disposal	Identify sites			
Damage assessment	Train teams, set MOUs			
Restore utility services				
Establish reconstruction priorities				
Reoccupancy permits	Set policies			
Emergency demolition	Set policies			
Emergency permitting	Set policies			
LAND USE				
Identify new lessons from damage assessments	Review case studies			
Compliance of rebuilding with regulations from new lessons				
Replanning of stricken areas	Identify nonconforming uses, pre-FIRM bldgs.			
Identify sites for emergency operations				
Reexamine street patterns	Plan			
Feasibility of emergency evacuation plans	Identify shelters, road capacity, vulnerability			
Historic preservation	Identify vulnerable structures			
Implement building moratoria	Adopt policies			
Reevaluate and update plan				
REGIONAL COORDINATION				
Coordinate with relief agencies	Predisaster planning			
Temporary housing	Identify sites			
Financial assistance channels	Prepare inventory			
Transportation	Plan			
Emergency legislation				
Media contact	Predisaster education			
Mutual aid agreements		Put into effect		

The real issue is not so much which entity is put in the lead role but whether, if it is someone other the city manager or mayor, that entity and its director enjoy the full support of the local chief executive and legislative body in that role.

Prior training and rehearsal of these responsibilities tends to allow many types of urban officials (primarily in line agencies) to internalize their operational responsibilities to a point where they can follow the plan without even consulting it during the recovery period.

reconstruction. The question few communities have addressed directly is who will manage long-term reconstruction in accordance with a post-disaster plan. Establishing both the authority and the organizational structure for managing reconstruction is the primary objective of the model ordinance in Chapter 5. The objective here is to outline the rationale and the method.

Designated lead agency. Who will coordinate the process and oversee compliance with the intent of the post-disaster plan? There is no single answer to this question, but there are several possibilities that have worked or can work, depending on local traditions, local government structure, and other factors that may influence this decision, such as the nature of the jurisdiction (e.g., city, county, jurisdiction size). Three likely candidates are the mayor's or city manager's office, the planning or community development department, or a local redevelopment agency. Where a post-disaster plan and local ordinance establish a recovery and reconstruction task force, a designated representative of the lead agency, presumably its director, will then serve as the task force chairperson.

The real issue is not so much which entity is put in the lead role but whether, if it is someone other the city manager or mayor, that entity and its director enjoy the full support of the local chief executive and legislative body in that role. Because a disaster often involves a good deal of reliance on outside assistance, a clear choice of leadership for managing long-term recovery and reconstruction also provides a central point of contact, information, and accountability for the outside world. This, in turn, increases the community's ability to marshal the external resources it needs.

Empowerment of a reconstruction planning task force. The plan should set out the circumstances and guidelines for empowering a task force specifically to deal with overseeing the process of planning for long-term reconstruction following the disaster. The point of this element should be to incorporate the intent of the discussion in Chapter 3, under "Long-Term Goals and Short-Term Pitfalls," dealing with task force composition. This element of the post-disaster plan should establish the composition of the task force in advance of a disaster, so that the actors can anticipate and train for their roles. This group is distinct from the broader body overseeing plan development, mentioned at the beginning of this chapter, and is focused on implementing the reconstruction process itself. The Los Angeles plan (1994) describes this as a "proactive rather than reactive approach. . . through post-event formation of a long-term reconstruction task force and preparation of a strategic plan for reconstruction."

Operations policy. Once the lead agency has been chosen, it is important to establish the line of reporting and responsibility for implementing recovery and reconstruction. If this report in its entirety has established anything, it is that this process is complex and often represents a struggle by the entire community to reassert its viability. That struggle will proceed much more smoothly if a post-disaster plan already has established the mechanisms and timelines for various municipal officials to perform their assigned tasks and to report to the lead agency in order to keep the recovery process well-coordinated.

In an analysis of the effectiveness of the Los Angeles plan after the Northridge earthquake, Spangle Associates and Robert Olson Associates (1997) found that prior training and rehearsal of these responsibilities tends to allow many types of urban officials (primarily in line agencies) to internalize their operational responsibilities to a point where they can follow the plan without even consulting it during the recovery period. For the lead agency, and even for other staff agencies, consultation is more likely to be necessary, but, for many other local officials, the time constraints involved

in post-disaster responsibilities may make internalization through training a more efficient option. The point is to establish this in the plan and train people accordingly, and, then, after the plan has been tested, to reevaluate how well it has worked and to update the plan on the basis of experience.

Just as there is a lead agency for overseeing the recovery and reconstruction process, post-disaster plans spell out specific actions to implement their stated policies and designate lead agencies and participating agencies for those actions.

Operations policy should also address the probable need for interdepartmental assignment of personnel with special skills needed in an emergency and beyond. For instance, employees with bilingual skills may be vital for certain recovery operations in agencies other than those that hired them and can be lent to others that need such services.

Coordination with emergency manager. This topic was covered in Chapter 2, so it should be sufficient to note here that a point repeatedly made in current disaster literature is that there are no clear lines between the emergency period, short-term recovery period, and long-term reconstruction. Certain aspects of all three of these processes may be occurring within different parts of a community and its local government at the same time. In many of the communities studied for this report, including those examined by Robert Deyle and Richard Smith for the Hurricane Opal case study in Chapter 10, it is apparent that planners and emergency managers too seldom communicate with each other. The result is that planners do not have an effective sense of the challenges facing the community in managing emergency response and post-disaster recovery and a lack of understanding among emergency managers of the important role planning can play in moving the community beyond short-term recovery and in incorporating hazard mitigation into everyday (i.e., pre-disaster) planning activities.

Public participation and hearings. The first section of this chapter discussed the need to build community consensus behind a vision for how the community will rebuild after a disaster in accordance with the goals it has already laid out in its comprehensive plan. The plan itself should contain reasonably extensive and effective opportunities for public input and comment before it is adopted, and those opportunities should allow for meaningful public education in the bargain. Because economic recovery is so central to the success of any post-disaster recovery effort, special attention needs to be paid to involving the business community and soliciting its expertise on issues that will facilitate business revitalization. Because the plan will need both to be updated periodically and to undergo revisions in the aftermath of actual disasters, it helps if the plan includes provisions for ensuring continued public education and input on the plan's goals and purposes. The resources on citizen participation mentioned in that section, as well as others available from organizations like APA and the International City/County Management Association, should be sufficient to allow any community planning agency to craft an effective system for involving the public and winning its cooperation in implementing a post-disaster plan.

Rehabilitative Functions

No matter how brilliant a community's vision for long-term reconstruction may be, in the aftermath of a disaster few residents will show much patience with that vision unless the local government is prepared to respond quickly and effectively in restoring fundamental needs like housing and basic services like trash disposal. Unfortunately, as various examples throughout this document illustrate, trash disposal—including the disposition of toxic materials spilled or released during the disaster—takes on gargantuan proportions compared to normal circumstances. In the absence of some clear procedures, the city may not

The plan itself should contain reasonably extensive and effective opportunities for public input and comment before it is adopted, and those opportunities should allow for meaningful public education in the bargain. Because economic recovery is so central to the success of any post-disaster recovery effort, special attention needs to be paid to involving the business community and soliciting its expertise on issues that will facilitate business revitalization.

only find itself hard-pressed to make emergency arrangements for such services, but it may also be paying private contractors premium prices in a seller's market. The rehabilitative functions necessary to buy time to handle long-term issues include all aspects of cleaning up and assessing damaged sites, and of processing those assessments and repair permits so as to facilitate the return to habitable structures of the maximum number of local residents in the shortest possible time frame.

This rehabilitation occurs simultaneously in both the public and private sector, with the former overseeing the latter through regulation. For the sake of sorting out operational from regulatory responsibilities in the plan, the following discussion divides rehabilitative functions into those involving primarily public or private responsibilities. It should be noted that building departments, not planners, are principally involved in the latter group of responsibilities, but that these elements address issues about which planners may wish to express some concerns during the plan development process.

Public-Sector Responsibilities

Temporary shelter. Providing the temporary shelter people need is a function for emergency managers, but planners should play a vital role by identifying appropriate sites in advance. Emergency shelter sites generally revert to their original uses, such as schools and community centers, after the recovery period, but other forms of temporary housing, including manufactured housing, can and often do become more permanent than may have originally been envisioned. Planners can help to ensure during the pre-disaster period that, if this happens, the sites identified for such housing are zoned appropriately.

Refuse disposal sites. Planners are normally involved in solid waste management only to the extent that facilities to accomplish this mission must be sited somewhere. Certainly, the process of contracting for collection and disposal is most likely to be handled by a public works or sanitation department to whatever extent the local government is not performing this

This debris was moved to the side of the streets in southern Florida after Hurricane Andrew in 1992. Clearance and removal require planning and coordination to avoid creating extra work.



function itself. However, the post-disaster plan can make provisions for gaining a quick estimate of the scope of the problem, as in the plan for Hilton Head Island (1993), which incorporates this into the damage assessment process described below. Debris clearance is often traffic clearance as well, to the extent that roadways are blocked by felled trees or flood muck and thus impede other recovery functions. Lee County, Florida, (Ordinance 95-14) establishes road clearance as its first priority in this area, followed by area medical, fire, law enforcement, and emergency response facilities, recognizing, in effect, that the overriding priority is access.

The volume of debris amassed for collection and disposal following a major disaster can easily escalate overnight by orders of magnitude (U.S. EPA 1995); in the aftermath of Hurricane Andrew, in fact, the area had to dispose of a volume of debris equal to what it normally manages over a five-year period. Rush-hour traffic jams in parts of southern Dade County, Florida, in the fall of 1992 sometimes consisted of nothing but long lines of trucks carrying their daily load of construction debris to designated area landfills. That situation was an extreme but speaks to the crisis planners must anticipate: Where will the debris go? Designating appropriate temporary and permanent disposal sites as part of the post-disaster plan allows this question to be incorporated into an area's long-term land-use plans for the siting and eventual closure of landfills. The issue, however, does not stop there, for a great deal of construction debris is potentially recyclable. Planners can help to designate appropriate sites and procedures for managing the process of sorting recyclable materials from nonrecyclables and thereby aid in conserving landfill space for the longer term. Ensuring the smooth functioning of this service also speeds the clearance of debris-ridden sites so that properties may be repaired and rebuilt, and enhances the prospects for economic recovery by eliminating potential eyesores.

Assessment of building conditions and overall damages. This process was described at the beginning of Chapter 2 in the description of the preliminary damage assessment (PDA). The PDA is used to determine whether a presidential disaster declaration is justified. However, damage assessment is an ongoing task that may take different forms at different stages of response and recovery, starting with a minimal windshield survey, involving observations from passing vehicles by fire, police, and emergency management personnel, to more detailed and in-person surveys by building inspectors. The function of damage assessment should be included and addressed as an element in a post-disaster plan regardless of the magnitude of the disaster as a matter of clarifying lines of responsibility. For instance, the Florida Department of Community Affairs model (TBRPC/Hillsborough County 1995) provides for the designation of a local damage assessment team responsible for conducting the assessment.

The town of Hilton Head Island (1993) spells out three levels of damage assessment, which ends with a damage survey report. Doing so provides local officials with a quick general survey early on that anchors progressively detailed assessments as needed within the days following the initial event. These types of assessments are, in order:

- the windshield survey, usually done within 24 hours to assess overall impact and conducted from a moving vehicle;
- the initial assessment, more detailed and done within three to four days and conducted with town and county, and if necessary, state officials; and
- the preliminary damage assessment, or PDA, to warrant federal assistance.

Restoring utility services is an essential prerequisite for beginning economic recovery and for restoring some measure of comfort to those whose routines have been disrupted.

Restoration of utility services. Few of the effects of a disaster make people feel more helpless and isolated than the loss of heat, power, and telephone service. Although various modern technological innovations in solar heating, photovoltaic cells, and cellular telephone service are making some people increasingly independent of highly centralized service delivery systems, the fact remains that most people rely on grid-based utility services most of the time. Moreover, even these decentralized utility technologies are vulnerable to interruption under certain circumstances. Restoring utility services is an essential prerequisite for beginning economic recovery and for restoring some measure of comfort to those whose routines have been disrupted. It is a matter of public safety, as well, for local firefighting ability is at stake when electrically operated water pumps no longer work. It can also be a matter of life and death for home-bound elderly people, the disabled, and others, or for families stranded without power in cold climates, such as happened in January 1998 in Quebec and upstate New York.

Unless a publicly owned electric utility is involved, most of the problem of restoring utility services will typically fall to the private sector. However, utility services that typically are in the public sector, such as sewer and water lines, are necessarily affected by electric power outages. Also, the nature of the service disruption will vary with the nature and extent of the disaster. Floods, for instance, are far less likely to disrupt electric service (with the exception of ground-level transformers) than are disasters involving high winds or seismic shaking. But the 1993 Midwest floods did disable water service for the entire Des Moines metropolitan area by overflowing the levees protecting the water treatment plant.

It is thus essential that the post-disaster plan address the need for restoration of all utilities and outline priorities for accomplishing this mission. This is often linked closely with the restoration of critical public facilities. For instance, the Hilton Head Island plan (1993) establishes three top priorities each for restoration of electrical and telephone service. (See Figure 4-4.)

Where private utilities have their own plans for emergency restoration of services, it is sufficient to refer to that plan and simply make clear who the responsible parties are in each instance. For instance, the Hilton Head Island plan lists both public service districts and private companies and the specific services and locations for which they are responsible. However, the local government's indication of desired public priorities can assist and direct the privately owned utility in its operations. It may also be necessary to detail any required cooperative efforts between units of government where public service districts serve more than one jurisdiction or municipality or where regional entities are involved. This may involve making arrangements with other utilities for mutual support. Incorporating mitigation techniques into the reestablishment of utilities may also affect timelines and procedures, as well as requiring mutual assistance from an outside utility.

Establishment of reconstruction priorities. Public facilities often suffer as much damage as private property in a disaster. Civic buildings, fire and police stations, hospitals, and schools have all suffered damage or destruction in major disasters. One critical function of a post-disaster plan is to establish the community's priorities concerning reconstruction of these facilities, given the obvious fact that limited resources and personnel may not allow simultaneous rebuilding of everything.

In many plans for post-disaster recovery and reconstruction examined for this report, a single element dealing with restoration of public facilities addresses both the restoration of public utilities and the reconstruction of public buildings and facilities. While these issues clearly are interrelated,

Figure 4-4. Priorities for Utility Restoration, Hilton Head, South Carolina

Electrical Restoration Priority

1. Hilton Head Hospital
2. Fire Stations and Emergency Medical Service Bases
3. Hilton Head Federal Emergency Operations Center

Telephone Restoration Priority

1. Hilton Head Hospital
2. Hilton Head Dispatch
3. Hilton Head Federal Emergency Operations Center

they can be quite different in an operational sense, and so we recommend that these issues not be confused or conflated. There are many variables that may enter into the selection of priorities for rebuilding public facilities, including the likelihood that the damage will cripple essential public services whose operation depends on the condition of the facility, and the urgency of the need for the services provided. In this sense, hospitals and public safety facilities almost always rise to the top of the list, as do any facilities that serve as emergency operations centers or shelters. (However, other elements listed in this chapter ought to address siting of the latter two functions with an eye to making them as immune to danger as possible.) On the other hand, the restoration of public recreational facilities, while important in the long term, would not seem as urgent in the immediate post-disaster environment.

Dealing with demand for building permits. This issue is tightly tied to the implementation of mutual aid agreements, another element discussed below under regional cooperation. It deserves attention here, however, because one of the most predictable consequences of the damage and destruction resulting from a disaster is a surge in permit applications. While this is not a problem with which planners will deal directly (except when they assist in performing paperwork functions to fill in for building officials out in the field), it is an issue the plan itself should address because of the serious problems that a growing backlog of applications can cause, including poor oversight in the permitting process, inadequate and hurried inspections, and public disgruntlement at the slow pace of the recovery.

FEMA provides limited assistance to states and communities to perform building department functions, such as inspections and substantial damage determinations under NFIP, and planning functions, such as plan review, but the requested assistance must have been addressed in the post-disaster FEMA-state agreement. There are two parts to this assistance. First, the community can get help in evaluating local codes and the building department's existing capacity. Second, as a result of the evaluation, the community may be eligible for assistance for extraordinary costs involved in the plan review and in the permitting of reconstruction. In addition, for the short term, under the public assistance program in Section 406 of the Stafford Act, FEMA can help local departments with health and safety inspections related to determining the habitability of buildings.

Financial assistance channels. Knowing where to access financial assistance both for restoration of business activity and for residential reconstruction allows for a more smoothly functioning process of recovery and reconstruction. This is the primary reason why the effective use of disaster assistance was identified as a policy objective of the plan in Chapter 3. People are deeply concerned about money in the recovery period following a disaster. Local officials can point people in the right direction and even help find sources of money they might otherwise never have known existed.

Private-Sector Responsibilities

Reoccupancy standards and permitting. Post-disaster conditions can pose a bewildering variety of threats to public health and safety, many of them lurking in residential buildings and in workplaces. The safety of residential buildings is particularly crucial because of their round-the-clock occupancy. When and under what conditions may people reoccupy partially damaged structures? Clearly, the goal is to rehouse people as soon as this can be done safely. The plan needs to establish how the work involved in performing this task can be done expeditiously and the standards that will be applied for interim reoccupancy of damaged structures. These policies need to be established in the pre-disaster period, though the implementation will flow out of the information generated through the damage assessment process.

One specific set of criteria that must play a role in this element relative to buildings in floodplains pertains to NFIP minimum regulations governing the determination of substantial damage, which refers to damage where the cost of restoring the building to its pre-flood condition would equal or exceed 50 percent of its pre-flood market value. Any community participating in NFIP must enforce provisions of its floodplain management ordinance dealing with measures to reduce future flood damage.

Emergency building demolition procedures. Disasters result in irreparably damaged buildings, many of which may constitute an imminent danger to public health and safety. There is no question that the city may use its police powers to remove these dangers in a timely fashion, but it still must follow due process. Moreover, having the capability in place to do so requires some planning because the work load can escalate dramatically, particularly following a significant earthquake or wind-driven event like a tornado or hurricane. While most of the implementation usually will fall to the building department, the plan should spell out the criteria and procedures that apply in an emergency.

As an example, the Los Angeles plan (1994) makes it the city's policy that demolition "be done as expeditiously as possible." It then calls for:

- establishing criteria for contractual agreements (and the contracts themselves) with the private sector;
- due processes and procedures for demolition;
- clarifying roles and prerogatives concerning historic buildings and reconciling legitimate hazard mitigation and historic preservation interests;
- doing the same concerning design review decisions connected with post-disaster repair and rebuilding of public structures; and
- including historic preservation and design review representatives in the investigations to minimize potential controversy.

Emergency permitting of building repairs. As with demolition proceedings, the work load for processing permits for building repairs will escalate dramatically after a disaster. A community without special procedures, including mutual aid agreements to borrow building permit personnel from other communities or private contractors, will find its residents growing surly as bureaucratic delays prevent necessary repairs, or even worse, residents may bypass the permitting process entirely, thus derailing post-disaster mitigation efforts.

In addition to importing permit-processing personnel as needed, an issue covered under the subsection below on regional coordination, the community can establish in its post-disaster plan and by ordinance criteria and procedures for streamlining and expediting permit review. In some cases, as in Oakland following the East Bay Hills fire (see case study in Chapter 11), this can be accomplished in part with the use of a special one-stop permit processing and disaster assistance center near the scene of the disaster.

The ordinance should spell out the length of time during which this system will apply. It may also make special provisions for deferring the payment of required fees to allow people a chance to recover first. Of course, permitting must still take place with an eye to mitigation, for example, by requiring elevation or similar measures in a floodplain, in accordance with local ordinances implementing NFIP. Local departments will want to avoid permitting that is at cross purposes with the substantial damage requirements of NFIP, particularly where the need arises to delay rebuilding to facilitate acquisition of substantially damaged properties.

Land Use

Of the various categories of elements in the post-disaster plan, this section is the most crucial. The overall intent is to provide for the means of learning valuable new land-use lessons from the disaster, to enable the city to incorporate them consistently into its mitigation plans and to amend its post-disaster plan as needed, and thus to minimize future risk by fostering a culture of adaptation to new information. This is, in other words, the primary feedback loop. More specifically, the appropriate amendments would tend to focus on updating priorities for changes in land uses or properties for acquisition or various forms of hazard mitigation, as well as planning changes in capital improvements planning, street width and design, and other issues affecting overall urban design.

Identifying new lessons. It is important for planners to remember that the first day of the post-disaster period is also the first day of the pre-disaster planning period that should precede the next event. When that lesson permeates the community's thinking, the identification of new lessons can serve as a powerful driver for all other land-use elements in the post-disaster plan, most particularly including the process of reevaluating and updating the plan after each disaster and modifying appropriate linkages with the local comprehensive plan as well. Thus, the progression from identifying new lessons to their incorporation into an amended plan should be seen not as a sequence of planning steps, but instead as a closed loop that leads to steady improvements in shaping a more disaster-resistant community. The most explicit way to remind the entire community of the need for reassessment is to include in the plan itself a discussion of planners' intent to revisit the hazard identification section of the plan after any disaster in order to incorporate new lessons.

What is the relationship of newly discovered or known hazards coming out of recent hazard events to existing or planned land-use patterns? Are these hazards serious or probable enough in future events to justify new land-use efforts to mitigate their effects? Earthquakes remain a key area where these

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Thus, the progression from identifying new lessons to their incorporation into an amended plan should be seen not as a sequence of planning steps, but instead as a closed loop that leads to steady improvements in shaping a more disaster-resistant community.

It does little good to learn valuable new lessons about natural hazards affecting the community if none of them are put to use. It is essential to prepare in the post-disaster plan a means for incorporating those lessons as rapidly as possible into the development regulations that will guide the reconstruction process.

The plan should contain policy statements indicating clearly, before the disaster occurs, that the most hazardous areas will not necessarily be rebuilt.

lessons are continuing to materialize because of the difficulty of adequately identifying subterranean faults. The fault slippage that caused the Northridge earthquake, for instance, was approximately 11 miles below the surface and had not previously been identified. Once these new lessons have been identified, land-use planning can provide a mechanism for associating them with appropriate new policy responses. These responses can extend to implications for infrastructure extension or replacement, for access routes and the feasibility of future evacuations, and for the zoning of various types of buildings and building construction techniques. State agencies can play a role in this process by facilitating the transfer of geologic and other data that local planners can use as a tool to reduce local hazards (for example, see the recommendations in Seismic Safety Commission 1994b).

Compliance of rebuilding with regulations developed from new lessons.

It does little good to learn valuable new lessons about natural hazards affecting the community if none of them are put to use. It is essential to prepare in the post-disaster plan a means for incorporating those lessons as rapidly as possible into the development regulations that will guide the reconstruction process. This may be, however, one of the most challenging elements of the entire plan precisely because it takes time to study, identify, and analyze new hazards information from a disaster, and even more time to craft regulations in response to them. It is often not possible for all rebuilding to await such analysis. But the plan should contain policy statements indicating clearly, before the disaster occurs, that the most hazardous areas will not necessarily be rebuilt.

Nonetheless, the entire process of rebuilding often takes years. In the initial stages, a temporary rebuilding moratorium of reasonable duration can buy some time where land use, rather than construction standards for rebuilding, is the central issue. Many of the plans and ordinances examined for this report anticipate a moratorium of up to 30 days, but what is allowable in any given jurisdiction may depend on state planning laws and existing local ordinances. (For a summary of applicable state laws concerning building moratoria, see Ziegler (1997), Section 11.03 [2], dealing with express statutory authority.) The model ordinance in Chapter 5 provides advance authority for a designated director of the local recovery organization to establish a moratorium for up to 90 days, subject to review by the city council within that time. The actual time needed will depend to a considerable degree on the type of hazard involved and the history and extent of knowledge of its occurrence locally. In other words, some cases are fairly obvious and require little additional study, but others are more complex and demanding, particularly where new hydrologic or geologic studies are required.

While it is likely to be impossible to apply these lessons to all post-disaster reconstruction, it is better to apply it where possible than not at all. Providing for some process of review and revision that will allow this to happen is an astute move for any local government.

Siting of emergency operations centers. If a local government is going to function effectively during a crisis, it must at least secure its own facilities for continual operation. More than one city hall found itself below decks in the Midwest floods of 1993, a situation that forces the staff to pay primary attention to salvaging and relocating valuable documents and equipment when they should be focused on recovery and reconstruction. During a 1996 flood, the same thing happened to the village of Plainfield, Illinois, whose 1990 tornado is the subject of the case study in Chapter 9.

While the security aspects of emergency operations are the responsibility of local emergency managers, planners can play a role in the pre-disaster

period by identifying alternate sites for continued governmental operations during disasters. If there is any danger that existing city offices will be affected by predictable types of disasters, planners can find suitable office locations outside known or probable hazard-prone areas that would allow government to resume its essential functions in the post-disaster period.

Replanning of stricken areas. Replanning uses the new lessons about local hazards to reshape the community's long-term vision for particularly hard-hit parts of the city. This function ought to be addressed in two stages: pre-disaster and post-disaster. The pre-disaster portion of this element would entail the identification of areas that may not be rebuilt after a disaster, accompanied by options for how those areas may be treated during the post-disaster period. The post-disaster aspect would consist of a review and analysis of these same areas to determine the most appropriate resolution of the planning problems they present.

If an area has proven more vulnerable than previously thought, perhaps reducing density or even considering acquisitions or easements for open space should become an option. The Los Angeles plan (1994) incorporates this function into its process of long-term reconstruction with both a restrictive and an opportunistic action program:

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Pre-event

- D.5.1 Identify the relationship of identified natural and man-made hazards and unique economic, housing, growth management, and urban design opportunities to Safety Element and community plan land-use and hazard mitigation policies.
- D.5.2 Revise community plans to acknowledge areas with identified natural and man-made hazards and, where appropriate, adjust land-use and other designations with the involvement of community planning advisory councils and the city planning commission.
- D.5.3. Conduct studies leading to adoption of specific plans and special overlay zones in areas with identified natural and man-made hazards, providing for appropriate mitigation based on specific circumstances.

Post-event, long term

- D.5.4. Modify community plan land-use designations in response to newly discovered hazard conditions which cannot be mitigated other than through change of use or reduction of planned land-use densities.
- D.5.5. Modify community plan land-use, circulation, and other designations (elements) to reflect economic development, housing, growth management, or urban design opportunities generated by the disaster.

Reexamination of street patterns for emergency access. The Oakland fire case study in Chapter 11 illustrates the significance of this element all too well. The issue applies to other hazards as well. For example, Topping and Sorensen (1996) describe the use of GIS in a new town plan formulated for Kobe, Japan, following its 1995 earthquake. The plan provides multiple road crossings across a fault zone to and from the community so as to preserve access if one or more is blocked. Reexamination of street patterns is also a potent consideration in coastal and riverine floodplains, particularly in areas of active erosion (see the Nags Head case study in Chapter 4 on page 84). In floodplains, roads should approach buildings from the direction opposite the floodplain and avoid disrupting the natural drainage pattern (Morris 1997).

Disaster Threats and Planning Solutions for Historic Buildings

“Haste makes waste” is an adage that has special poignancy with regard to historic properties in the aftermath of a disaster. Hasty decisions are particularly devastating when they are made without any guidance from a post-disaster plan developed beforehand. Local planning departments and historic preservation commissions can play an important role in preparing owners and building officials to make informed decisions during a period when time is often critical. It is important that they understand the obstacles to survival that historic properties may face in the aftermath of a disaster. Carl L. Nelson (1991), in *Preserving the Past from Natural Disasters*, lists the “unthinking or seemingly uncontrollable actions” that may hasten the destruction of damaged historic resources in the aftermath of a natural disaster.

WHAT COULD GO WRONG

1. Restorable buildings are torn down.
2. Architectural elements are carted away with the debris.
3. Trees are tossed out rather than replanted.
4. Property owners make hasty and inappropriate repairs.
5. Archeological resources are disturbed by heavy equipment.
6. Government agencies—such as building permit offices and landmarks commissions—may operate with conflicting goals.
7. Normal design review procedures for changes to historic properties may be suspended.
8. A crush of construction applications may overburden officials.
9. Inspections of historic structures may be carried out by persons with minimal or no qualifications, including volunteer structural engineers and other experts from outside the area.

Preplanning for these problems can make a big difference. The following are some options to consider in preparing the historic preservation element of a post-disaster plan, which should be clearly linked to the historic preservation element of the local comprehensive plan.

WHAT COULD GO RIGHT

1. Provide local public safety officials with maps and floor plans for major historic facilities, such as museums, private libraries, etc. Having these may help to prevent damage from some of the emergency operations such officials must perform following a disaster.
2. Establish lines of communication in advance between local planning and building officials and a designated disaster coordinator for such facilities.
3. Use a thorough inventory of local historic resources and their vulnerabilities to establish priorities for post-disaster preservation efforts. Not everything may be saved, but it is important to know what is most likely to be restorable and why.
4. The historic preservation community can be mobilized by plan to muster second opinions about buildings that might otherwise be deemed appropriate for demolition. Maintaining efficient and effective review procedures for such buildings may identify alternatives that save such buildings from the wrecking ball. Evaluating historic buildings for structural repairs often requires special expertise beyond that of a structural engineer or building inspector.
5. Work with the state historic preservation officer (SHPO) and others to provide or identify for the owners of historic buildings training resources and opportunities pertinent to protecting their buildings from the impacts of disasters.
6. Identify, create, and promote the use of financial and technical assistance resources for hazard mitigation and retrofitting for historic resources and, where possible, incorporate suitable historic properties into local hazard mitigation plans.

Feasibility of emergency evacuation plans. The logic of addressing this point, and of reassessing it in the disaster aftermath, flows naturally from the point above. However, in addition to public safety officials, emergency managers should be involved in the preparation of this element.

In some highly vulnerable locations, such as coastal barrier islands, evacuation issues may be deemed to pose larger questions concerning long-term development patterns. For instance, in its section addressing post-disaster mitigation opportunities, Hilton Head Island (1993) explores the merits of an evacuation-based growth cap. The idea was to conduct a study of what would constitute an acceptable growth limit given the fact that the town has only a single bridge and causeway for access to the mainland. In a separate section (pages 134-136), the plan discusses the constitutionality of such a cap, noting decisions from Florida (*City of Hollywood v. Hollywood, Inc.*, 432 So.2d 1332, 1983; *Healy Co. v. Town of Highland Beach*, 355 So.2d 813, 1978) that suggested that an annual growth cap based on sound planning would pass muster. Such a cap has been in effect in Sanibel, Florida, for some years without any apparent legal challenge. However, it is important to note that Sanibel is nearly built out. A community cannot use a growth cap to escape its responsibilities to build adequate infrastructure for the growth it has already permitted, including that necessary to facilitate evacuation.

One important caveat noted in the Hilton Head Island plan's legal discussion is that a town's refusal to invest in the expansion of evacuation infrastructure might undercut the justification for growth controls. A second that has continued to vex the town since the plan was prepared is its inability to win effective cooperation from mainland communities and the state in coordinating evacuation traffic in hurricane situations. Long-range planner Jill Foster (1997) reports that this lack of cooperation results, as in Hurricane Fran, in traffic congestion immediately after residents reach mainland routes. During Hurricane Hugo, she says, the mere lack of a highway patrolman at a rural intersection three counties away from Hilton Head Island resulted in a 55-mile-long backup that delayed traffic for three hours. Nonetheless, Hilton Head Island plans to revisit the issue as it develops new plans in the future including a combination flood and hurricane hazards mitigation plan.

Historic preservation. Built in another era, engineered to earlier standards, many historic buildings are no longer deemed seismically safe or capable of standing up to other natural hazards, such as wind and flood damage. Reconciling the preservation of the historic structure with public safety needs in view of modern engineering standards poses one of the more vexing dilemmas in disaster planning. As noted previously, involving representatives of the historic preservation community in the necessary decisions and task forces can aid in reducing the level of tensions. Nelson (1991) describes how Mayor Joseph P. Riley of Charleston, South Carolina, succeeded in saving much of that city's heritage following Hurricane Hugo with a timely invitation to historic preservation leaders to assist in the reconstruction process. Nelson also discusses the role California preservationists played in slowing the demolition of damaged historic structures with a second opinion campaign directed at saving those that needed only minor surgery to remain usable. The accompanying sidebar highlights both the obstacles to successful post-disaster historic preservation and the planning solutions that can minimize the losses that might otherwise result.

Turner (n.d.), in one of a series of handbooks produced for the U.S. Geological Survey, outlines the essential measures that can be taken to ensure adequate attention to historic preservation during post-earthquake

Reconciling the preservation of the historic structure with public safety needs in view of modern engineering standards poses one of the more vexing dilemmas in disaster planning.

The point is that a moratorium should be anything but indiscriminate, as different parts of a community, especially a larger city, are often affected in very different ways.

Nature on the rampage shows little respect for humanly designed political boundaries, and the vast proliferation of suburban, township, and small town governmental structures that dot the American landscape has made the need for interjurisdictional cooperation ever more apparent.

recovery and reconstruction. Despite problems in this area following the Loma Prieta earthquake (described in a case study in Chapter 12), he notes that California shortly thereafter enacted California Public Resources Code, Section 5028, which requires a local government to obtain permission from the State Office of Historic Preservation before demolishing any disaster-damaged building. This forces the local government to document the extent of damage. Turner suggests that such mechanisms could well be adapted in other states and that Ohio set a midwestern precedent by including in its state disaster plan provisions for including state historic preservation office (SHPO) personnel on damage assessment and damage survey teams regarding public historical sites. Since the 1993 Midwest floods, representatives from SHPOs are often included on hazard mitigation teams.

Plans for hazard mitigation of historic properties in the post-disaster plan should take account of the funding assistance provided by FEMA under the Hazard Mitigation Grant Program created under the Stafford Act, as discussed previously, and the technical assistance available for preparing the required state hazard mitigation plan, which certainly can include guidance on the treatment of historic buildings. In addition, public assistance money may reimburse the costs of demolition for unsafe historic buildings after the proper determinations are reached in cooperation with a SHPO. Other sources of monetary and technical assistance outside FEMA that the plan can incorporate include the National Endowment for the Arts, the National Park Service, and the American Institute of Architects.

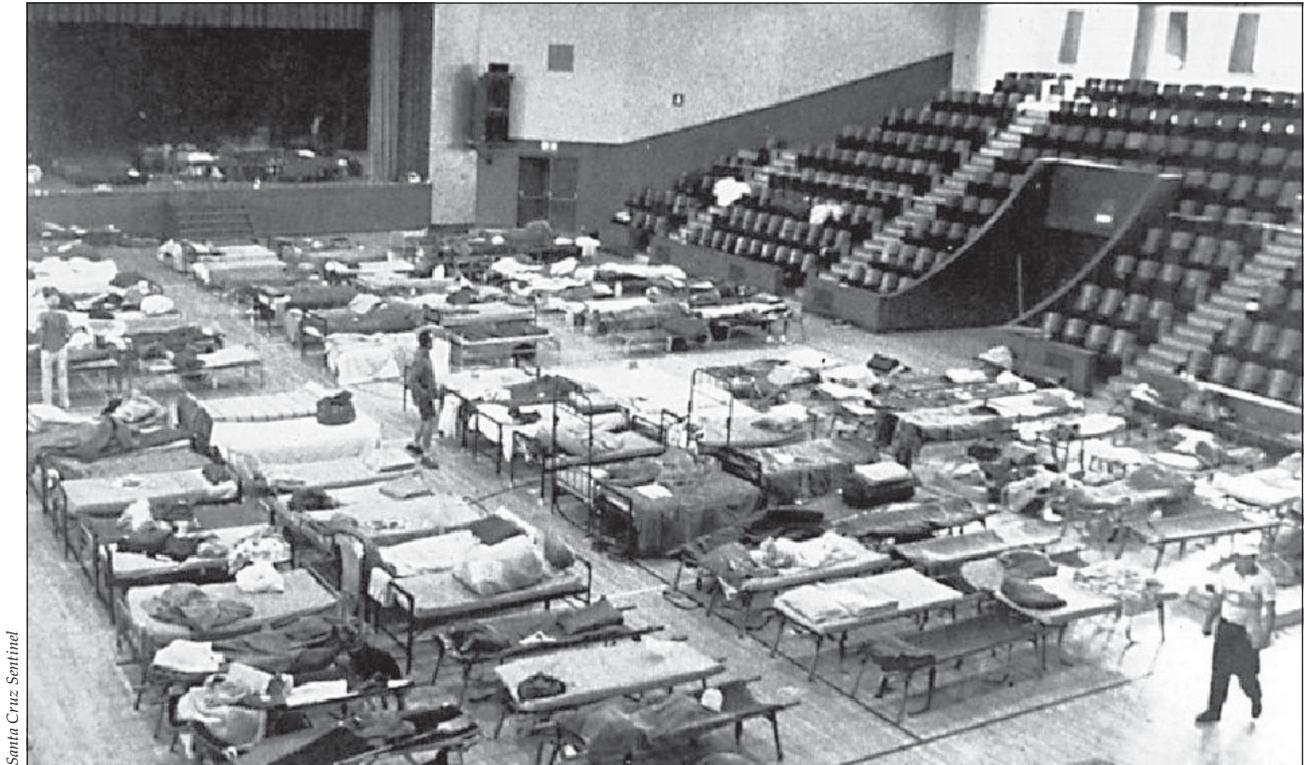
In addition to Nelson (1991) and the USGS guidebook, FEMA Region I (n.d.) and the National Trust for Historic Preservation (1993) have produced helpful short guides for safeguarding, or restoring, historic properties from the effects of natural hazards.

Implementation of area-specific building moratoria. A building moratorium is a typical post-disaster plan device, designed to buy time for local officials to gain control of the recovery and reconstruction process before irrevocable decisions compromise opportunities for mitigation. It also provides building officials with the time they need to complete damage assessments and establish priorities, often in triage fashion, for the use of limited local public resources. Although the formulas vary, plans spell out levels of damage that will trigger the imposition of a building moratorium for a specific area of the community. The point is that a moratorium should be anything but indiscriminate, as different parts of a community, especially a larger city, are often affected in very different ways. Where little or no damage has occurred, there is little or no rationale for restraining development. Hilton Head Island provides for three damage classes depending on levels of damage. For more commentary on this point, see the model ordinance in Chapter 5. Although placing this issue within other land-use elements in the post-disaster plan is an option, addressing it in a separate element would ensure that the plan establishes a clear rationale for putting a building permit moratorium into effect.

Regional Coordination

Rare indeed is the disaster of any consequence that affects just one local jurisdiction and whose impacts stop at the city limits. Nature on the rampage shows little respect for humanly designed political boundaries, and the vast proliferation of suburban, township, and small town governmental structures that dot the American landscape has made the need for interjurisdictional cooperation ever more apparent. The need for coordination is accentuated when a disaster reaches the level of a state or presidential declaration because mechanisms of state and federal disaster relief come into play. As if that were not enough, a host of nonprofit services stand

ready to respond but need effective points of contact in local communities so that their efforts are not duplicated and wasteful. Natural disasters spur marvelously the generosity of the American people, but effectively distributing donated relief supplies requires some planning and coordination lest their arrival merely add to the chaos or frustration. (Although it is a more extreme example, Underhill (1956) comments in her wonderful book on the Navajo Nation on the tribal president's bewildered reaction when he examined boxes of totally inappropriate donations sent in the early 1950s to help suffering Navajos cope with a crippling winter blizzard in the Arizona mountains.)



Santa Cruz Sentinel

The essential point is that no post-disaster plan can be regarded as complete without some component detailing the nature of the community's relationships with:

- neighboring local governments;
- regional planning commissions (the federal Economic Development Administration has funded regional planning commissions to hire a long-term recovery coordinator in the post-disaster period, especially when there is a clear relationship between recovery and a community's economic viability);
- higher-level jurisdictions, such as the county, state, or federal government; and
- nonprofit and private-sector entities that may aid relief and recovery efforts.

Coordination with nonprofit relief services. The first step in detailing this section of the plan is to establish an effective inventory of those nonprofit entities that are likely to respond to or be involved with the

This civic auditorium served as an emergency shelter in Santa Cruz, California, in the aftermath of the Loma Prieta earthquake in 1989.

community in the event of a disaster. For the most part, planners will not deal directly with such services unless they are involved with long-term reconstruction. It is nonetheless valuable to be aware of their role and the external resources they may bring to the community.

FEMA maintains coordination with major national organizations, such as the American Red Cross, Mennonite Disaster Services, and many others through National Voluntary Organizations Active in Disasters (NVOAD). NVOAD thus is an effective source of information on the strengths of the various organizations and the types of tasks they typically perform. Most communities also have local and regional organizations, often including national and local businesses, that are willing and able to assist in emergencies or to donate goods and services to disaster-stricken areas. Examples include Anheuser-Busch Company's provision of drinking water during the 1993 Midwest floods, and donations by farm organizations in the past of food or livestock feed to aid other regions stricken by drought or flood. Some resources of this type may come to light during the public participation segment of the preparation of a post-disaster plan and can then be incorporated into the element of the plan providing for oversight and coordination with nonprofit disaster services.

As noted in the introduction to this section, it is necessary to have some coordination concerning incoming donations and their appropriateness for use in the local community. The American Red Cross is usually given this responsibility, with the local emergency management office taking responsibility for advertising through the news media and other channels information on the types of individual and corporate donations that would be most helpful in view of the situation. (A plainly stated delineation of these responsibilities appears in Annex L, "Volunteer Services," of the Tampa Bay regional hurricane plan (TBRPC 1992).) However, it should also be assumed that there may well be a need to coordinate the distribution of such supplies with neighboring jurisdictions and some policies to guarantee fairness and efficiency.

It should not be assumed that such aid is limited strictly to the emergency period. As noted in the example from Boone, North Carolina, concerning the effective use of disaster assistance, organizations like Habitat for Humanity may well be prepared to play a role in more long-term reconstruction, for example, by helping to restore the low-income housing stock in a community. Christmas in April is another group, similar to Habitat for Humanity, that works on repairs to homes for the elderly. Consulting local representatives of such organizations beforehand, including community development corporations, may open new avenues for effective long-term reconstruction with private resources coordinated with official local government objectives.

Coordination of temporary housing services. This is an ideal area of cooperation between emergency managers and planners. Housing is often in short supply in a disaster-stricken community because so much of it may have been devastated. Relief agencies, working with emergency management officials, are already busy providing temporary shelter for disaster victims in quickly assembled manufactured home parks, schools, or whatever other arrangements will meet people's needs in a crisis. Where then does a community put the disaster volunteers as they arrive?

An additional area of focus for some local governments, particularly in coastal areas, is the provision of emergency shelter for evacuees away from the worst-hit communities, such as those located on barrier islands. Small mountain communities vulnerable to wildfires may also fall into this category. In this instance, self-reliance is self-defeating, and what is needed is an agreement with a host community that is capable of handling some or all of the victims from the evacuated area. Planners can use the planning

process in this instance to find suitable locations outside hazardous areas. Their study should first examine existing shelter locations relative to locations within hazardous areas, including the accessibility of roads that will move people out of hazard-prone locations to safe shelter.

Transportation. Disaster victims suffer disconnection with the outside world almost entirely in one of two ways: loss of communications and loss of transportation. Disruption of the latter can take a wide variety of forms, as all modes are vulnerable depending on the circumstances. A thorough plan for regional coordination of the restoration of transportation access needs to consider air, water, rail, and street and highway issues. Almost nowhere else is the need for regional cooperation so apparent because transportation routes are the ties that bind communities. In the case of state and interstate highways, railroads, and navigable rivers, they also invariably involve management by entities other than local government. Although airports are often managed by large central municipal governments, entire metropolitan areas, if not larger regions, have some stake in their restoration to normal service. Thus, even the local post-disaster plan element addressing transportation should at a minimum establish responsibility for effective liaison between local transportation officials and those in metropolitan, regional, special district, state, or federal agencies who are managing recovery in these areas.

One clear example of the stake that an individual community has in a major transportation artery involves the fate of the Embarcadero Freeway in San Francisco following the Loma Prieta Earthquake. The overhead freeway was long seen as critical in delivering a steady flow of tourists to Chinatown, but in the end its reconstruction was abandoned in favor of a sunken freeway that has reunited the community with its nearby waterfront. In that instance, San Francisco officials were able to control the outcome after a vigorous debate.

A different type of example emerged from the massive flooding of midwestern states in 1993, when thousands of miles of railroad track were rendered unusable. Railroad officials worked long hours rerouting shipments along those tracks that remained viable, adding long hours and miles to freight shipments through the Midwest. For communities along those routes that relied on the railroads to deliver farm products and other supplies, restoration of the flooded trackage to service was essential to their own economic recovery, even though they themselves could exercise no direct control over the progress of the effort. Both situations emphasize the need for local input and coordination with nonlocal officials concerning transportation issues.

The potential fragility of regional transportation corridors is an issue that especially affects the viability of emergency evacuation plans for communities, particularly in coastal or riverfront locations, with a need to remove large numbers of residents from harm's way. The discussion above about Hilton Head Island's reservations about pursuing an evacuation-based growth cap and the potential futility of doing so in light of a lack of regional coordination of emergency transportation routes illustrates the potency of this element of interjurisdictional coordination. Most major transportation routes run through numerous local jurisdictions, and traffic coordination in an emergency can be a mess. While that particular function can be handled largely through cooperative agreements among local public safety officials, it is important to know that such agreements are in place.

Beyond that, however, lies the possibility of permanent damage to transportation infrastructure, as has occurred in many earthquakes and is not uncommon in other types of disasters. Flooded or wind-damaged bridges, underpasses, and other potentially long-term obstructions to traf-

fic require some prior consideration of intermunicipal agreements concerning the temporary rerouting of traffic and mitigation plans for the restoration of damaged transportation facilities. Very often, these considerations require cooperative efforts with county, state, regional, and federal transportation officials to effect a solution.

Emergency legislation at state and federal levels. Often, in the process of preparing a plan for post-disaster reconstruction, community officials identify needed programmatic changes at the state or federal level that would require new legislation. In such instances, the plan should include discussions of the types of legislation that would produce the needed improvements. While the local community cannot control the disposition of its proposals to state or federal legislators, a well-documented case illustrating why a certain type of enabling statute or some other measure would help often does result in new legislation. Florida and California plans, in particular, contain a number of examples of such issues. The Los Angeles plan (1994), for example, included lobbying for and supporting legislation to create disaster-loss reserve funds at the state and federal levels to implement a seismic retrofit program for state facilities.

Coordinated media contact for accuracy and consistency. Natural disasters offer wonderful opportunities for officials at all levels to garner media attention. The cacophony that is sure to result when everyone is allowed to do so is best avoided with a clear plan of action for directing media questions to a single designated source through whom information from other participants can be channeled. Not only is this a wise option within specific communities, but where questions do not pertain to a particular jurisdiction, it is also preferable, through prior agreement, to channel them to a more regional source of information, such as a county public information office or even the governor's press office. Officials drafting post-disaster plans should anticipate different levels of emergencies and consider what might be appropriate based on the geographic extent and magnitude of the disaster. In disaster field offices, both federal and state media representatives are often co-located to facilitate such coordination.

Mutual aid agreements. Especially within a diverse metropolitan area, there are going to be significant variations in the capabilities of neighboring communities to respond to the challenges of a natural disaster. No single relatively unscathed community in a disaster-stricken area can expect to remain an island of tranquility if its neighbors are struggling. Everyone benefits from quickly implementing previously developed agreements to provide assistance where it is needed. These agreements can cover virtually any of the functions previously discussed in this chapter, including the use of police and fire personnel, emergency housing, the restoration of damaged transportation routes and utilities, communications, social services, building inspectors, and, yes, even planners.

The Division of Emergency Management of the Florida Department of Community Affairs (1994) has a statewide mutual aid agreement to which local jurisdictions may become parties that covers many of these points. The Building Officials Association of Florida covers one major specific need following disasters with its own memorandum of understanding with the state to supply the inspectors needed after a disaster for habitability inspections (Florida DCA 1995b). These agreements spell out procedures for identifying needed assistance and dispatching the appropriate personnel to the requesting communities.

Floods often involve the need for additional building officials, many of whom are needed in extreme flood events to make the required substantial damage determinations under the NFIP. This is also true in nonflood events

that occur wholly or partially in floodplains, as in the case of the Plainfield, Illinois, tornado. (See Chapter 9.)

The post-disaster plan offers an opportunity for community self-assessment to determine where potential deficiencies in resources and personnel might surface following a disaster. No community can reasonably ratchet up the size of its staff or its stockpile of equipment to meet all the contingencies that might occur in a disaster. The sensible approach is to identify these potential shortcomings and remedy them through interjurisdictional mutual aid agreements that allow the community to call upon outside resources when they are needed, much as communities have long done with such public safety emergencies as fires or civil disturbances.

Reevaluating and Updating the Post-disaster Plan

One final issue must be considered in completing the inventory of post-disaster plan elements—that of keeping it current. Plans that age without periodic revision become largely irrelevant, but it is not hard to build into a plan provisions for revisiting the issues addressed and updating the elements in light of new experience. Certainly, two events ought to trigger an automatic update of the plan: the actual occurrence of a disaster, which allows the plan to be tested and revised on the basis of its actual successes and failures, and changes in the comprehensive plan requirements that affect the workings of the post-disaster plan. Beyond that, the plan should include some routine periodic schedule according to which the planning department can reexamine the validity of the assumptions underlying its work plan, or simply alter some provisions to reflect changes in the community over time. The update probably ought to occur somewhere between every one and five years, depending on the frequency and severity of the natural hazards events affecting the community.

FEMA already requires post-disaster revisions of state hazard mitigation plans, but individual communities have the opportunity to monitor their own plans in far more detail. Including a program for periodic review and revision also allows a community to measure its progress and ensure implementation of those actions it decided to address in the pre-disaster period. With the widespread and growing use of various types of community and sustainable development indicators, planners have the opportunity to use this process in the post-disaster plan to incorporate into those indicators measurements of the community's progress toward a more disaster-resistant future.

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