

Chapter 3

Policies for Guiding Planning for Post-Disaster Recovery and Reconstruction

Every plan has a purpose. Under the U.S. Constitution, land-use planning has been used to advance legitimate state purposes concerning public health, welfare, and safety. Beneath these broad categories are a number of more specific policy objectives that justify a wide range of plans, plan elements, and accompanying regulations. Chapter 6 of this report deals with the legal issues surrounding land-use planning concerning natural hazards. The focus of this chapter is on establishing the policy objectives that underlie the exercise of developing plans for post-disaster recovery and reconstruction.

Simply put, the driving factors behind such plans are public safety and economic recovery, the latter obviously being a specific aspect of the public welfare. Allowing unwise and inadequately protected development in locations known to involve serious dangers from natural hazards amounts to a failure of planning to serve one of its most vital public functions. If planners take great care in many communities to separate residential housing from noxious industrial fumes or vibrations, or to establish minimum distances of churches and schools from sexually oriented businesses, does it make less sense to keep homes and schools out of the path of floods and landslides? Even more to the point, if a post-disaster situation affords the opportunity to remedy some past land-use planning mistakes in this regard, does it make sense for the community to forego such opportunities simply because it failed to plan for them?

By the same token, if planners involved in economic development take great care to try to attract an effective mix of industrial and commercial uses that will enhance the local economy and make best use of its labor pool and other resources, is it wise to put all that at risk by failing to consider how the local economy can be protected from the impact of natural disasters? Both the business community and working residents have a major stake in plans that help to ensure a quick and efficient recovery from whatever economic devastation may occur in a natural disaster. A plan for post-disaster recovery and reconstruction that is well crafted to assist business recovery, ideally with the aid of a local redevelopment agency that has given serious thought to such contingencies, clearly is a major means of advancing the public welfare.

Nonetheless, only half the states, in their planning enabling statutes, mention natural hazards at all as a concern that should or may be addressed in comprehensive plans. Of those, only 11 mandate some sort of planning for natural hazards, either in the form of a distinct natural hazards element (sometimes referred to as a safety element, as in California and Nevada) or in the form of hazards-related content in another element (as in Maryland, where certain natural hazards must be addressed in a sensitive areas element). Of those 11, only Florida includes a requirement for a local plan for post-storm recovery, and the mandate applies only in coastal counties.

This information (see Figure 3-1) was gathered while preparing the model state planning legislation for APA's Growing SmartSM *Legislative Guidebook*.

Figure 3-1. State Enabling Statutes with Natural Hazards Content

State	Local Plan Mandated	State Land Use Policy Basis	Strength of State Role	Internal Consistency Required	Hazard Statute Citation	Jurisdictions Covered	Hazards Element Mandatory?	Discrete Hazards Element	Geographic Coverage	Which Hazards Specified	Post-Disaster Recovery Element	State Technical Assistance
1	2	3	4	5	6	7	8	9	10	11	12	13
AZ	P(CT, T); M(C)	N	1	N	11-806.B.	C, CT	CT>50,000	Y	All	C (F), CT (H, G)	N	DOC-DMG; OES
CA	M(C, CT)	N	2	Y	65302(g); 65302(e)(7)	C, CT	Y	Y	All	G, T, S, F, W	N	
CO	P(C, CT)	N	1	N	30-28-106; 31-23-206	C, CT	N	N	All	F	N	
FL	M(C, CT)	Y	3	Y	163.3177 (6)(g) and (7)(h) and (l); 163.3178	C, CT	Y	Y	Coastal River corridors	C, W, F	Y	DCA
GA	M(C, MN)	Y	3	Y	12-2-8	C, MN	N	N	All	F*	N	
ID	M(C, CT)	N	2	N	67-6508(g)	All	Y	Y	All	G, S, F	N	
IN	P(C, CT)	N	1	N	36-7-4-503	All	N	N/Flood control & irrigation	All	F	N	
IA	O(CT)	N	1	N	281.4	?	N	N	All	F	N	
KY	M(C>300K); M(CT>300K); P(C)	N	2	Y	100.187 (5)	Same as column 3	N	Y	All	F	N	
LA	P(P, MN)	N	1	N	R.S. 33:107	P, MN	N	N	All	W, H	N	
ME	P(CT, T)	Y	3	Y	30-A 4326.A(1)(d)	MN	Y	N/Growth areas implementation strategy	All	F	N	
MD	P(C, MN)	Y	3	Y	3.05(a)(1)(viii)	C, MN	Y	N/Sensitive areas	All	F, S	N	DNR
MI	P(CT, V, TP, C)	N	1	N	125.36	All	N	N	All	F	N	
MT	P(CT, T, C)	N	1	N	76-1-601(2)(h)	C, T, CT	N	N	All	F	N	
NV	M(C, CT)	N	2	N	278.160.1(k) and (l)	All	Y	Y	Seismic-all; safety plan-C>400,000	G, F, W, S	N	CRC, EMC
NC	O(C, CT)	N	1	N	113A-110 ff.	C	Y	Y	Coastal	F, C	N	LCDC
OR	M(C, CT)	N	1	Y	197.175	C, CT	Y	Y	All	F, T, E?	N	

Figure 3-1. State Enabling Statutes with Natural Hazards Content (continued)

State	Local Plan Mandated	State Land Use Policy Basis	Strength of State Role	Internal Consistency Required	Hazard Statute Citation	Jurisdictions Covered	Hazards Element Mandatory?	Discrete Hazards Element	Geographic Coverage	Which Hazards Specified	Post-Disaster Recovery Element	State Technical Assistance
PA	P(C, CT, T, TP, B)	N	2	N	10301(2)	All	Y	N/Land use	All	F, H	N	CRC
RI	M(CT, T)	Y	3	Y	45-22-2-6(E)	CT, T	Y	N/Natural and coastal resources	All	F	N	CRC
SC	P(C, CT, T)	N	2	N	6-7-510	C, CT, T	N	N	Coastal	F, H (under Beachfront Management Act)	Y (under Beachfront Management Act)	
UT	O(C, T, CT)	N	2	N	10-9-302(2)(c)	C, CT, T	N	N/Environment	All	F, F, S	N	
VT	P(T, CT, V, G)	Y	3	N	4382(a)(2)	All	N	N/Land use	All	F	N	
VA	P(C, T)	N	1	N	15.1-446.1.1	C, T	N	N/Land use	All	F	N	
WA	M(C, CT therein)	Y	3	Y	36.70.330 (1)	C, CT	N	N/Land use	Puget Sound watershed	F	N	
WV	P(C, CT, T, V)	N	2	N	8-24-17(a)(9)	All	N	Y	All	F	N	

Key to Figure 3-1

1. Only those states with statutes that mention natural hazards are listed. There are 25 such states.
2. This overview, which is based on more than one statute, indicates whether municipalities must have a natural hazards or similar element. (See column 7 for a list of specific jurisdictions covered by the state's natural hazards legislation.) The letters M, O, and P are used to indicate whether planning is Mandatory, Optional, or mandated if a precondition is met (e.g., if a planning commission is created). The other symbols in this column are keyed to type of jurisdiction: B (borough); C (county); CT (city); G (gore); M (municipality); P (parish); T (town); TP (township); and V (village).
3. Indicates whether there is a state land-use policy regarding natural hazards.
4. The state role is classified as 1 = weak; 2 = significant; and 3 = substantial.
5. Indicates whether internal consistency between plans is required.
6. This column provides a citation to the provisions that reference natural hazards. In some cases, these references occur in more than one place (e.g., in enabling legislation covering municipalities and counties). In others, the provisions may be in a part of the state code governing natural resources or coastal zone management.
7. Natural hazards provisions or hazard mitigation planning provisions specifically apply to these types of jurisdictions. See note 2 for the key to jurisdiction types. More elaboration is provided in columns 10 and 11 about geographic coverage and which hazards are specifically covered.
8. Indicates whether a hazards element is mandatory in local planning and which jurisdictions are covered, along with population requirement, if any. See column 9 to see whether the mandate is for a discrete plan element focused on natural hazards or a mandate to include natural hazards in a related element (e.g., environment or land use). See also columns 10 and 11 for the specifics of the mandate.
9. Y indicates that a discrete natural hazards plan element is required. N indicates that the issue of natural hazards is covered in another element, which is named after the slash. For example, steep slopes and floodplains are mentioned in the mandatory sensitive areas element in the Maryland statutes.
10. A few states apply the natural hazards element mandate only to areas of the state; those areas are specified here.
11. Indicates which types of hazards are mentioned in the state legislation. The key is as follows: C (coastal storm); E (earthquake); F (floodplain); G (geologic hazards generally); H (all hazards generally); S (slope-related hazards, including landslide erosion, avalanches, and landslides); T (tsunami); V (volcano); and W (wildfire).
12. Only one state in this column has a post-disaster recovery element; we include this column to draw attention to this device as a distinct element from the natural hazards element. Such an element would not just identify hazards; it would identify how a community plans to rebuild so as to become less vulnerable to future disasters.
13. This column provides a shorthand for the agencies that provide assistance in the preparation of a natural hazards element. In California, these agencies are the Department of Conservation, Division of Mining and Geology (DOC-DMG) and the Office of Emergency Services (OES). In Florida, it is the Department of Community Affairs (DCA). In Maryland, it is the Department of Natural Resources (DNR). In North Carolina, it is the Coastal Resources Commission (CRC) and Environmental Management Commission (EMC). In Oregon, it is the Land Conservation and Development Commission (LCDC). And in Rhode Island, it is the Coastal Resources Center (CRC).

Model Post-Disaster Plan Language for a Natural Hazards Element

(Chapter 7, Section 7-210,
of the *Growing SmartSM*
Legislative Guidebook)

- (5) The natural hazards element shall consist of:
- ...
- (f) a plan for managing post-disaster recovery and reconstruction. Such a plan shall provide descriptions that include, but are not limited to, lines of authority, interagency and intergovernmental coordination measures, processes for expedited review, permitting, and inspection of repair and reconstruction of buildings and structures damaged by natural disasters. Reconstruction policies in this plan shall be congruent with mitigation policies in this element and in other elements of the local comprehensive plan as well as the legal, procedural, administrative, and operational components of post-disaster recovery and reconstruction.

For the complete text of the Natural Hazards Element, see Appendix E.

Chapter 7 of that guidebook includes legislation and commentary concerning local comprehensive plan elements. Specifically, the work involved drafting statutory language concerning the preparation of a natural hazards element in local comprehensive plans. This language included specific provisions concerning the preparation of a plan for post-disaster recovery and reconstruction.

Two factors should be noted about the general absence of planning enabling statutory provisions concerning natural hazards. First, most states have planning enabling legislation that remains based to varying degrees on the original model statutes promulgated by the U.S. Department of Commerce under Secretary Herbert Hoover in the late 1920s. At that time, research of any type about the pattern of natural disasters and the potential to ameliorate their impact through planning was virtually nonexistent. Consequently, statutes drafted in that era with only modest subsequent revision reflect that lack of awareness of the role that planning could play. Only as legislatures have taken note of the more recent research in this area, or have been prodded to some degree by federal programs, such as NFIP, has this changed in states that have not yet engaged in a wholesale redrafting of planning enabling legislation. However, in states like Florida, Oregon, and Maryland, where planning laws have been completely rewritten, specific provisions concerning natural hazards tend to be included. Even still, only Florida includes planning for post-disaster recovery as part of that process.

Second, while state mandates certainly push communities in the direction of planning for post-disaster recovery and reconstruction, that is not the only way in which such planning happens. Several communities outside the states with mandates have simply taken the initiative of doing such planning on their own and for their own benefit. Los Angeles, concerned about a range of hazards that most significantly includes earthquakes and wildfires, adopted such a plan in early 1994. Arnold, Missouri, highlighted in a case study in Chapter 8, is an example of a city that effectively used its floodplain management plan for this purpose. Part of Chapter 4 will discuss the means by which officials and interested citizens in these and other communities built public support behind the need to develop such a plan.

However the community arrives at the decision to develop its plan, four simple constant factors pervade the process: goals, strategy, priorities, and criteria. These factors apply equally well to hazard mitigation plans intended to be employed before the disaster strikes. First, having decided on the goals for the plan—say, reducing vulnerability to coastal storms by preserving the integrity of barrier islands and ecologically sensitive tidal wetlands—the community must then develop a strategy for achieving that goal. The choice of appropriate strategies will depend on technical data concerning the feasibility of specific strategies for coping with local hazards, political preferences for specific approaches to the problem, and cost implications. Creative planners employ the concept of multiobjective management, in which hazard mitigation objectives are made to coincide with the policy objectives of other stakeholders in the community. Such stakeholders may include parks and recreation advocates who see benefits in preserving a greenbelt and trail system along the riverbank, tourism promoters who may see great value in preserving undisturbed views of the mountainsides just outside the city, or even developers of multifamily housing who can gain a density bonus through a transfer of development rights from hazardous areas. Multiobjective strategies can help to expand the resource base available to accomplish mitigation objectives and thus widen the community's vision of what can be accomplished.

Implementing strategies requires the elaboration of priorities, and the establishment of priorities must be based on clear criteria. Criteria in a plan

are the hands-on means for planners to make day-to-day decisions about what actions are more important than others. How does one rank preferences for action in acquiring flood-prone land, for instance? Given an inevitably limited pot of staff time, money, and other resources, decision makers may choose to rank possible acquisitions based on rated criteria, such as elevation, erosion potential, and the contiguity of the parcels being acquired, among other likely considerations. The choices of criteria will vary depending on local circumstances, values, and politics.

One final point in introducing the next section of this chapter deserves repetition throughout the entire discussion of planning for post-disaster recovery and reconstruction. It deals with timing. Hazard mitigation that occurs after a disaster is still hazard mitigation in preparation for another disaster further in the future. Natural disasters are cyclical occurrences. Communities must incorporate that expectation into their planning and their environmental consciousness. Only the interval between disasters will vary with circumstance.

Regardless of the specific natural hazards that must be identified and addressed, planning for post-disaster recovery shares some common elements. Disasters and their aftermaths tend to follow essentially the same sequence of events, with adjustments varying with the scope of the event. Much of this sequence will occur with or without planning, and much of the early research in this area examined communities that lacked plans for post-disaster recovery simply because very few—if any—communities had such plans. What we have gained from disaster recovery research is the knowledge of how to focus the efforts behind such plans to achieve meaningful, lasting results toward sustainability. Achieving sustainability, which, in a disaster-related context, means the ability to survive future natural disasters with minimum loss of life and property, is the overarching goal of planning for post-disaster reconstruction. Policy objectives are the measurable landmarks a community sets out for itself in seeking to achieve that goal. This section is about the process of defining those objectives.

LONG-TERM GOALS AND SHORT-TERM PITFALLS

The immediate post-disaster period is obviously one with immense potential for confusion, or at least for many of those involved to take actions that serve opposite or divergent purposes. Decisions must be made quickly, with little time for reconsideration before new problems urgently demand resolution. Thus, an essential purpose of the plan for post-disaster recovery and reconstruction is to provide some vision that serves as a beacon for decision makers and some framework within which decisions will be taken. However, it is the role of civic leadership to help maintain that focus when it really matters. The policy objective in this respect is to avoid situations in which short-term decisions adversely affect the community's potential for achieving long-term post-disaster goals.

Unexpected contingencies can always arise in the aftermath of a disaster, no matter how good the pre-disaster planning, in large part because no plan developed in the pre-disaster period can anticipate the precise nature of the next disaster. But the plan can provide decision makers with some general guidance as to the policy objectives their decisions must aim to achieve. This serves to minimize unintended consequences and to keep the maximum number of players working toward the same ultimate goals. Communities that develop plans for post-disaster recovery and reconstruction can highlight what they regard as their most essential objectives in what is sometimes called a vision statement in other types of plans. It is, essentially, the place where the community articulates its overall desires with regard to the focus of the plan in question. Because so much is at stake in planning for

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post-disaster recovery and reconstruction, the vision statement should be clear but broad in its view of the positive consequences for the community if the plan is properly implemented. It should provide an overall framework within which more specific policy objectives, discussed below, can fit.

Short-Term Recovery Issues that Affect Long-Term Reconstruction Goals

The vision statement can help provide overall motivation and inspiration for a community to achieve its objectives during post-disaster recovery and reconstruction. But attention to detail also counts for a great deal. Real success in long-term reconstruction stems from both effective plan guidance concerning the big picture and an acute awareness by planners and other local officials involved in post-disaster recovery of the short-term obstacles that often thwart the achievement of those larger goals. Here, we shall explore what those are.



National Weather Service

Winds from Hurricane Hugo in 1989 were powerful enough to blow down the Ben Sawyer Bridge, which connects Sullivan's Island and Isle of Palms to the South Carolina mainland. That left island residents with only boat access to their homes and businesses.

One of the earliest messages to arise from modern disaster recovery research was that public decisions taken in the heat of the emergency period immediately following a disaster often compromise significant opportunities to rebuild a safer community for the future. The pressure exerted by residents and property owners to have their disaster-stricken community rebuilt to its pre-disaster form and condition as quickly as possible remains a powerful factor in local, state, and federal emergency management to this day.

There are ways to restrain such pressures and maintain mitigation and other post-disaster goals as high priorities during the process of long-term reconstruction even as the ashes, the rubble, and the water are receding or being cleared away. The secret lies in identifying in advance those decisions that will need to be made after a disaster that are most likely to have long-term repercussions for hazard mitigation. The case studies in the later chapters of this report are replete with examples of these decisions, but listing a few here will serve to illustrate the point:

- the location of temporary housing, which often becomes more permanent than was originally intended
- the siting of temporary business locations, which begin with the aim of allowing local businesses to continue to operate, but may become de facto long-term relocations
- the selection of sites for dumping disaster debris
- road closures and reopenings
- bridge closures and reopenings

- restoration of critical infrastructure that might otherwise have been suitable for relocation
- permitting the reoccupation of homes that have suffered substantial damage

Some tools for this process are already built into the emergency management system. For instance, emergency managers will already have a list of priorities for restoration of vital public facilities following a natural disaster. The local planning department, working with the emergency manager and other city departments responsible for infrastructure development and maintenance, can then review that list to determine areas of potential concern. Various types of damage assessments performed during the early recovery period provide opportunities to assess the effectiveness of previous mitigation efforts. The planning staff can establish a procedure for participating in the assessments themselves or for reviewing these damage assessments to glean any meaningful land-use lessons they may offer. Making effective use of those lessons often requires a planning department to buy time, which can be done through an ordinance establishing the authority for declaring a temporary building permit moratorium during an emergency. The ordinance should provide for necessary exemptions for building activities that are vital to public health and safety during the recovery period, which may include restoring essential public services or constructing an emergency shelter for those rendered homeless by the disaster, and should specify the duration of its effectiveness. More details on this particular planning tool appear in Chapter 5.

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The central element of good decision making in the short-term recovery period following a disaster is the community's designation of a recovery management team that is empowered to monitor the process and implement the community's post-disaster recovery policies. (This is a management team that is distinct in both function and form from the plan development task force that will be discussed at the beginning of Chapter 4.) Relatively few communities have done this to date, but the idea is making headway. Lee County, Florida, and the town of Nags Head, North Carolina, both can claim actual experience in implementing such a policy, and Los Angeles had just barely adopted such a scheme when the Northridge earthquake hit the city in 1994. Although some doubt has been expressed concerning the planning department's effectiveness in the Los Angeles scenario, its limitations following that disaster appear to be attributable to circumstances that include a mayor and city council concerned primarily about business recovery and a pervasive perception within city government that the earthquake did not warrant planning intervention. Nonetheless, prior training may well have internalized many of the mechanisms prescribed in the plan for line agencies performing recovery operations (Spangle Associates and Robert Olson Associates 1997).

The big question for any community establishing such a team is its composition. Figure 3-2 shows the structures used by some of the communities mentioned above. These are larger jurisdictions that have primarily chosen to use department heads representing major agencies that must act quickly during the post-disaster period or have major stakes in the outcome. Representatives of major private-sector agencies, such as the local business community (e.g., Chamber of Commerce) or social service agencies (e.g., United Way) are essential additions to such a task force. Involving private citizens, whether as individuals or as representatives of civic organizations such as block clubs or neighborhood organizations, is critical in enhancing the quality and breadth of input into decision making during this crucial period.

Figure 3-2. Recovery and Reconstruction Task Force Composition

The table below offers a comparison of the organizational composition established by three different Florida counties for task forces empowered to guide recovery and reconstruction following a disaster. In addition, the lead agencies are listed for Los Angeles as designated by its recovery and reconstruction plan, although they do not serve on a task force like those in the three Florida counties. The information is drawn from the *Post-Disaster Redevelopment Guide for Pinellas County*; Lee County Ordinance No. 95-14, adopted August 2, 1995; the *Palm Beach County Post-Disaster Redevelopment Plan*; and the Los Angeles Recovery and Reconstruction Plan.

One interesting point is that Lee County, in a 1990 ordinance, gave its recovery task force a role in pre-disaster mitigation planning, an idea that is worth copying elsewhere. However, it revised this initial structure with the 1995 ordinance, which established a two-tier arrangement in which a new Post-Disaster Recovery Task Force (RTF) is mobilized after a disaster while containing, as ex-officio members, the members of a separate Disaster Advisory Council (DAC), which officially replaced the former recovery task force. Thus, in the Lee County column below, positions are followed in parentheses by designations of either RTF, DAC, or both. The Lee County ordinance also specifies four positions, with specific listed duties, to be filled by recommendations from the task force. These are disaster recovery coordinator, economic recovery coordinator, hazard mitigation coordinator, and tourism recovery coordinator. Also, "other representatives" may be added by the county administrator in Pinellas County. The Palm Beach County plan seems to leave room for other representatives but does not make clear who would designate them.

Finally, because jurisdictions often use different titles to describe similar functions, the generic term is used in the Member column, but any unique label that a specific county applies to that function is used in that county's box in place of the "x" that otherwise designates that the director of that agency is part of the task force. Where someone else is officially designated to represent the agency, that is also noted in the box.

MEMBER	PINELLAS	LEE	PALM BEACH	LOS ANGELES
County Administrator/Mayor	X	RTF/DAC	X	Mayor
Legislative Liaison				Chief Legislative Analyst
Emergency Management				Emergency Operations Board
Clerk's Office				X
Public Safety	Civil Emergency Services	RTF/DAC	X	Police/Fire
Planning & Zoning	X	Local planning agency member (DAC)	Planning, Zoning and Building	City Planning
Public Works	X	RTF/DAC	County Engineer	X
Transportation		Transportation Director and Transit Director (both DAC)	Surface Transportation	X
Building	X		*see Planning and Zoning above	Building & Safety
Environment	Environmental Management		Environmental Resources Management	Environmental Affairs
Legal	X	DAC		X
Fire Chief		Representative of County Fire Chiefs Association (DAC)	X	
General Services	X	Administrative Services Director (DAC)		X

(continued)

Figure 3-2. Recovery and Reconstruction (continued)

MEMBER	PINELLAS	LEE	PALM BEACH	LOS ANGELES
Utilities	X	DAC		Telecommunications/ Water and Power
Risk Management	X			
Social Services	X	Human Services (DAC)	X	
Management and Budget	X	Budget Services Director (DAC)	Financial Management and Budget	City Administrative Officer/Personnel/ Treasury
Public Information	Public Services and Information	DAC		Information Services
Animal Control	X			X
Redevelopment				Community Redevelopment Agency
Housing				X
Community Development	X	Community Services (DAC)	Community Services	X
Finance		DAC		
Tourism		Visitor & Convention Bureau (DAC)	Tourist Development Council	
Port Authority		DAC		
Equal Opportunity		DAC		
Health		Health Director and County Medical Examiner (DAC)		
Historic Preservation		H.P. Board member (DAC)		
Waste Management		Solid Waste Director (DAC)		
Parks & Recreation		DAC		X
Economic Development		DAC		
Facilities Planning, Design and Construction			X	
Cultural Affairs				X
Local Government Liaisons		Cities of Cape Coral, Fort Myers, Sanibel	Liaison to Municipal Governments	
Other Public Sector Liaisons		County Sheriff, County School District, SW Florida RPC	County Sheriff, County Solid Waste Authority, County School Board, South Florida Water Management District, Florida Department of Environmental Regulation, Department of Transportation	
Private Sector		Business community representatives	Private utilities	

While the examples above and in Figure 3-2 involve communities that established the makeup of a recovery task force in a plan developed during the pre-disaster period, other communities have established recovery task forces in the aftermath of natural disasters. Two examples materialized in the spring of 1997 with the tornadoes that struck parts of Arkansas. Arkadelphia, a community of about 10,000, within days of the March 1 event, established an open-ended recovery task force, inviting all residents, officials, and business owners to participate, forming several committees in the process. Later, a 15-member disaster recovery plan committee was appointed to work directly with Woodward-Clyde Associates, the contractor directed by FEMA to mobilize resources to develop and implement a recovery plan. Chaired by a foundation official, the committee included the mayor and city manager and various local citizens (Woodward-Clyde Associates 1997a). On the other hand, College Station posed a special problem because it is not a jurisdiction in its own right but a community that straddles the city of Little Rock and parts of unincorporated Pulaski County. There, constructing an eight-member disaster recovery plan committee, including officials of the community development corporation and credit union, a local civic group, and the Watershed Human Development Agency, required the cooperation of the city, the county, and the community itself (Woodward-Clyde Associates 1997b). A major theme that has emerged from such efforts is the need to include in some way all those who must be heard to ensure the plan's successful implementation.

Smaller communities may wish to pursue other approaches using simpler structures. Brower, Beatley, and Blatt (1987) also list three alternatives that emphasize greater involvement by elected officials. One is to create a group representing broadly based community interests, among which would be some agency heads who meet that criterion. This has the advantage of bringing a number of perspectives into play and ensuring a healthy variety of expertise. A second alternative would be to empower the local planning board or commission, which would ensure a familiarity with land-use planning but might often require some special training of citizen commissioners on disaster recovery issues. A final possibility is simply to devise a board wholly composed of local elected officials. This last option has a serious drawback in that the task force members might prove to be sorely overburdened in the aftermath of a serious disaster. In the end, however, each community must think through the issues connected with its own decision-making practices and circumstances and produce its own optimum solution. The model recovery ordinance that appears in Chapter 5 provides some options and language for communities seeking to craft a mechanism for guiding the post-disaster recovery process.

Nonconforming Uses

Planners everywhere become accustomed to problems involving nonconforming uses. These arise when zoning for a particular area is changed in a way that does not encompass some land uses already present in the affected zoning district. The standard procedure is to allow the continuation of the nonconforming use, but not to allow its expansion, its conversion to another nonconforming use, or its restoration in the event of its discontinuance or destruction. Thus, in the aftermath of a fire or flood that substantially damaged a nonconforming structure, the owner would not be allowed to rebuild that use at that location. The goal is to respect the vested rights of the owner of the nonconforming use while gradually or eventually eliminating such uses.

Under normal circumstances, issues involving the restoration or discontinuation of nonconforming uses arise one at a time, as a result of

events such as fires, conveyance of the property to new owners, or the dissolution or relocation of existing businesses. As such, they pose mostly a routine burden for local zoning officials. Major disasters, however, can create hundreds, even thousands, of nonconforming uses virtually overnight, each of which adds to the workload of an already stressed planning department, as well as posing serious questions for the integrity of the entire redevelopment process. In such circumstances, it is both politically and practically unlikely that the community will want to take an uncompromising stand against allowing the repair and reconstruction of all nonconforming uses. Disasters may pose an opportunity to eliminate nonconforming uses, even to reshape existing patterns of development along lines deemed more desirable, but they also generate enormous pressures from property owners to allow the reestablishment of the existing development pattern, complete with nonconforming buildings and uses. Such pressures result in part from the difficulty of finding enough suitable locations in the proper zoning districts for the relocation of those uses not permitted to be rebuilt. Under such circumstances, the community may need to face the question of where and how to compromise and for what reasons.

The solution, or at least an amelioration of the problem, may lie in establishing criteria for allowing the reestablishment of nonconforming uses under disaster-related circumstances. Section 7.9 of the model ordinance in Chapter 5 attempts to prescribe such conditions.

ECONOMIC RECOVERY

Economic recovery is quite likely the most serious issue facing most communities in the post-disaster period, and almost certainly the central issue in every major disaster. The extent of the disruption of normal economic activity varies with the type of disaster, the size and economic makeup of the community, and other factors, but the disruption invariably adds to the property losses already suffered by shrinking incomes, profits, and productivity.

The Tampa Bay Regional Planning Council (1994) introduced its *Model Community Post-Disaster Economic Redevelopment Plan* by recounting the staggering economic losses suffered in Dade County, Florida, following Hurricane Andrew:

- 8,000 businesses and more than 100,000 jobs seriously affected
- disruption of a \$500 million-per-year tourist industry for several years
- \$1 billion in damage to agriculture with permanent income loss of \$250 million
- daily lost output in storm-affected areas of \$22 million

The potential duration of some business disruptions is considerable. In December 1997, the island of Kauai in Hawaii finally witnessed the reopening of the Sheraton Kauai resort on Poipu Beach, closed after the September 11, 1992, destruction of Hurricane Iniki. Despite that reopening, three of the island's five major hotels remained closed at that point (Cannon 1997). The disruptions can entail substantial costs, such as the \$200 million in business disruptions suffered by Des Moines following the 1993 floods. Small businesses, in particular, are vulnerable, with some 30 percent not surviving when stricken by a natural disaster (Armstrong 1998). Other disaster-ravaged communities have their own statistics, all indicating that economic recovery needs to be at the top of the planning agenda for long-term recovery and reconstruction.

Major disasters can create hundreds, even thousands, of nonconforming uses virtually overnight, each of which adds to the workload of an already stressed planning department, as well as posing serious questions for the integrity of the entire redevelopment process.

Small businesses, in particular, are vulnerable, with some 30 percent not surviving when stricken by a natural disaster.

Establishing the Means to Facilitate Recovery

The first step in facilitating any type of recovery is anticipation of the consequences of a disaster as a means of identifying the strategies and resources needed to make it happen. While hazard identification per se is the topic of Chapter 7, the object here is to highlight the kinds of impact assessment needed in the pre-disaster period to allow planners to develop effective contingency plans to facilitate post-disaster economic recovery. In this respect, the Tampa Bay plan cited above offers a good model and a reasonably detailed example of a substantial compilation of that type of information, albeit on a regional basis. The report details estimated damages for various types of structures from hurricanes of varying strength, initial job losses, population displacement, and similar projections. Individual communities can certainly make their own detailed assessments. These projections can be delineated within a couple of major categories and several subcategories.

Inventory of potential structural damage. This is essentially what the Tampa Bay study does by positing potential hurricane paths and wind velocities in relation to the vulnerability of housing stock, industrial property, and commercial buildings. Also vital in this category of direct losses to structures is the estimated potential damage to public and private infrastructure.

Overall economic impact. These projections will estimate all possible indirect losses, such as the loss of economic activity suffered in Des Moines, Iowa, following the temporary closure of the water treatment plant. During the same Midwest floods, Iowa and other states suffered major disruption of railroad traffic, much of which had to be rerouted due to flooded tracks. Transportation-related economic losses can take other forms, such as the loss of major highway corridors, the collapse of the Oakland Bay Bridge during the Loma Prieta Earthquake, or the closing of local airports. As noted above, the loss of tourism, even in the short term, poses a major economic threat to many disaster-affected communities, particularly in the Sun Belt. All of these problems entail direct or indirect consequences that include job losses and the closure of previously viable businesses. Moreover, in communities with severely damaged residential neighborhoods, employee dislocation can result in the inability of much of the work force to continue its normal work patterns, at least temporarily complicating economic activity for businesses that might otherwise be unaffected.

In fact, that last issue is so potent in its impacts that the Tampa Bay model plan lists as its first goal, "Restore and enhance residential communities." Not only is this a matter of restoring normal life for the local work force in order to minimize productivity losses, but it is also a matter, as the plan notes, of reestablishing the residential market base for local retailers. Goal 2 in the plan is the restoration and enhancement of employment opportunities; Goal 3 the provision of public and nonprofit infrastructure and support services.

A related issue that good comprehensive planning should address in this regard is the differential impact of disasters on different communities or sectors within communities. Some low-income communities may, for instance, suffer disproportionate damage due to the relative age of housing stock and the limited financial capacity of many residents to undertake (or, in the case of tenants, even influence) effective mitigation measures or post-disaster repairs. Recovery thus becomes relatively more difficult and prolonged than might be the case in a more affluent neighborhood, and neighborhood businesses may also suffer accordingly.

Another important point that should be addressed by planners in facilitating economic recovery as a prime policy objective is the fact that disasters

Some low-income communities may suffer disproportionate damage due to the relative age of housing stock and the limited financial capacity of many residents to undertake (or, in the case of tenants, even influence) effective mitigation measures or post-disaster repairs.

produce an inevitable roller-coaster impact on subsequent economic activity. Economic activity takes a rough ride in which there is, first, a rapid downhill cycle in the immediate post-disaster period, during which the consequences detailed above are sustained. As recovery progresses, the local economy experiences an accelerated rate of growth, nurtured in large part by infusions of outside aid and the need for rapid restoration of local buildings and structures. During this period, the shape of local economic



Maridee Greenbacks

activity will also shift dramatically, emphasizing construction and services. As this physical restoration of the community comes to a close, economic activity flattens out to a more normal pace, and the structure of the local economy begins to regain its pre-disaster balance. The objective of the plan for post-disaster recovery and reconstruction is to take advantage of this process to build a community that is both economically stronger than it might otherwise have been and less vulnerable to future disruptions from natural disasters.

Downtown Grand Forks, North Dakota, was completely awash in water during the 1997 winter floods. The business district suffered severe economic setbacks and required substantial aid.

Building a Disaster-Resistant (Sustainable) Economy

The plan for post-disaster recovery and reconstruction should have, as part of its policy objectives concerning economic recovery, not just the objective of restoring normal economic activity but that of making it more resistant to such disruptions should nature strike again. In essence, this means seizing the opportunity, where it is deemed appropriate, to move the community's most vital businesses out of harm's way. In other cases, such as waterfront or water-related activities that must remain along the coast or shoreline or in a floodplain, the objective may instead be to make them less vulnerable to damage through floodproofing, elevation, or other structural mitigation approaches.

The most dramatic examples of building a disaster-resistant economy have come from small towns that have either completely relocated or at least moved their central business district from the path of disaster. Soldiers Grove, Wisconsin, set a notable example by relocating its entire downtown away from the Kickapoo River floodplain in the early 1980s, thus forever eliminating what had been a repetitive problem (Becker 1994a). With

assistance from the U.S. Department of Energy, Pattonsburg, Missouri, relocated to higher ground and likewise buffered its future business activity from flooding after the 1993 Midwest floods, as did Valmeyer, Illinois (Becker 1994b; Skinner and Becker 1995).

These small towns provide particularly clear examples of using post-disaster opportunities to build a more disaster-resistant economic base mostly because wholesale relocation on a small scale makes the results more obvious than is the case with measures taken to protect business districts in small parts of much larger communities. The same principles apply, none-



Bill Becker

Valmeyer, Illinois, a town along the Mississippi River that relocated to higher ground after the 1993 floods, has incorporated solar heating into many of its new buildings, including the community center.

theless, to the need to make industrial and commercial areas of larger communities more disaster resistant as a means of reducing the economic impact of future disasters. Most communities will face situations involving at most only partial relocations. Determining exactly which measures are appropriate and effective in accomplishing this mission is an essential function of the local planning process, much as the specific measures for mitigating all other structural and building damage must be chosen in light of the local hazard context. On a small scale, these measures include the relocation of vulnerable businesses from floodplains or the seismic retrofitting of older commercial and industrial facilities. On a larger scale, however, they may involve contingency plans for wholesale planned redevelopment of devastated central business districts, such as occurred in Fillmore, California, following the Northridge Earthquake (McSweeney 1997).

The Soldiers Grove and Pattonsburg examples, however, highlight more than just the issue of relocation of vulnerable businesses from the path of known natural hazards. Both communities have also seized the opportunity to make their local businesses and residential sector more environmentally and economically sound by institutionalizing energy efficiency in the rebuilding process. For instance, the Soldiers Grove building code requires that all new structures receive at least half their energy from renewable sources. Valmeyer's new civic buildings employ solar heating principles. These communities are, in effect, insulating themselves not only from future natural disasters but from economic shocks as well, by reducing energy

costs and thus retaining in the local economy the additional dollars saved, presumably generating new jobs as money recirculates locally instead of leaving the community. Of course, many of these measures can be taken at times other than following a disaster. However, few events besides disasters result in the need to rebuild so much of the community so quickly and hence pose the same opportunity to reshape the local economy so dramatically. The significant benefits of integrating principles of sustainable development into the process of post-disaster redevelopment have resulted in a modest but growing collaborative effort among federal agencies, such as DOE, FEMA, and HUD, and various state, local, and private-sector entities to facilitate this integration. (A particularly good source of examples can be found by clicking "Operation Fresh Start" within DOE's sustainable development Web site at <http://www.sustainable.doe.gov>.)

One final pair of points can be made here. The process of planning for post-disaster recovery and reconstruction affords the opportunity to think about building a disaster-resistant economy not only in a structural and locational sense, but in terms of the kinds of businesses that are more likely to recover quickly from disasters. For instance, a town totally dependent on tourism will probably face a more dire predicament following a disaster than one with a more diversified economy, some of which consists of industries more capable of withstanding the impact of a local disaster. The second point, closely related and intuitively obvious, is that making the local business sector more resistant to disasters in these and other ways discussed above provides fiscal insurance to the local government by making the local tax base itself more disaster resistant. When it comes to disasters, what is good for the local business sector is also good for the municipal budget.

The process of planning for post-disaster recovery and reconstruction affords the opportunity to think about building a disaster-resistant economy not only in a structural and locational sense, but in terms of the kinds of businesses that are more likely to recover quickly from disasters.

MITIGATION

Local government engages in hazard mitigation whenever it undertakes activities that are designed either to prevent future disasters (by keeping development out of harm's way) or to minimize or reduce their deleterious effects on property and infrastructure. Many activities that local government may not be able to mandate for private property owners may nonetheless be worth encouraging through means like public education campaigns and financial or other incentives. Also, while the damage from natural disasters is typically structural, the solutions need not be. Much of the most effective mitigation consists of nonstructural measures directing land use away from hazardous areas or even seeking simply to influence human behavior. The all-time classic example of the latter type of nonstructural mitigation is the U.S. Forest Service's Smoky the Bear advertising campaign, designed to reduce the risk of wildfires. For decades, most of the public was completely unaware of any positive role for fire in the natural environment. The fact that many wildfire experts now consider that campaign, in retrospect, almost too effective in shaping these exclusively negative public perceptions of wildfires serves to underscore the very power of the technique.

While little empirical research to date has been done relating plan quality to actual results in reducing damages from natural disasters, French et al. (1996) found in a study of the Northridge earthquake that a regression analysis of variables influencing damage showed the influence of public awareness policies in local plans to be a significant factor, along with the age of the buildings (correlated, obviously, to the building codes and land-use measures then in effect) and programmatic policies (affecting existing development). More research along these lines may serve to strengthen the hand of land-use planners urging greater emphasis in these areas.

The precise details of local hazard mitigation policies should grow out of the data amassed through hazard identification and risk assessment at the

The Benefits of Implementing Hazard Mitigation

Pinellas County, Florida, in its redevelopment guide, provides an excellent summary list of the local benefits of implementing hazard mitigation.

- Saving lives and reducing injuries
- Preventing or reducing property damage
- Reducing economic losses
- Minimizing social dislocation and stress
- Minimizing agricultural losses
- Maintaining critical facilities in functional order
- Protecting infrastructure from damage
- Protecting mental health
- Limiting legal liability of government and public officials
- Providing positive political consequences for government action

outset of the planning process, coupled with the development of community consensus concerning the means for mitigating those hazards and the extent of the effort directed toward that goal. McElyea, Brower, and Godschalk (1982) list six generic questions as key issues in a hazard mitigation planning process. The Florida Department of Community Affairs, in a model plan developed by the Tampa Bay Regional Planning Council and the Hillsborough County Planning and Development Management Department (1995), also uses those and details others for specific hazards, such as high winds, flooding, wave action, and severe erosion. Other Florida jurisdictions like Pinellas County (1994) have used them as well. More recently, the Florida DCA (1997) developed statewide guidance in two documents addressing mitigation planning. Jurisdictions outside Florida, of course, will need to develop their own hazard-specific issues for other hazard categories more relevant to local circumstances. A few model and actual hazard mitigation plans and guides from around the country that planners can tap for examples relevant to their own communities are listed in the sidebar. Many of these necessarily deal also with long-term reconstruction and redevelopment issues because the two goals so often are pursued concurrently. Six basic questions can be asked about the policies and regulations in effect. Do the policies and regulations:

1. recognize the existence of different hazard areas that are subject to different forces?;
2. cover all types of structures (single-family, multifamily, commercial, etc.)?;
3. apply to public facilities as well as private?;
4. encourage higher-density uses to locate outside the most hazardous areas?;
5. result in nonconforming uses and structures being brought into conformity after they are damaged?; and
6. relate the level of development in the community to the capacity of existing evacuation routes and the time it would take to evacuate those areas?

Having listed these questions, it is worth noting that, as with many issues in the field of planning, there will always be exceptions concerning their validity in certain circumstances. For instance, higher densities in some areas, such as earthquake zones with liquefaction potential, may actually better support the cost of structural mitigation measures. Also, as was discussed above, it is not always possible or desirable to seek the complete elimination of nonconforming uses.

Florida is one of a mere handful of states with a specific mandate requiring communities to include particular kinds of natural hazards mitigation elements in their comprehensive plans. In view of research by Burby and Dalton (1993) finding stronger plan quality where state mandates with sanctions drive a process of development and implementation of hazard mitigation elements, it may be unfortunate that so few states have gone this route as yet.

As discussed elsewhere in this report, NFIP also provides some guidance on mitigation specific to flood hazards, and the Coastal Zone Management Act and Coastal Barrier Resources Act provide some reinforcement in coastal areas. The 1994 National Flood Insurance Reform Act (Public Law 103-325) created the Flood Mitigation Assistance (FMA) program to assist local governments with funding for mitigation planning and projects.

Under its Hazard Mitigation Grant Program and Public Assistance program, FEMA has also sought to facilitate local cost-benefit analysis by developing a worksheet to determine funding levels. Local planning agencies can adopt or adapt it to their own needs.

The main impetus for most state and local mitigation planning, however, is contained in Section 409 of the Stafford Act (Public Law 93-288, as amended), which requires state and local governments to develop a hazard mitigation plan as a condition of receiving federal disaster aid. The state or local government must agree to evaluate natural hazards in the areas where the loans or grants are used and to take appropriate action to mitigate them. The rules for implementing these requirements are in the Code of Federal Regulations (44 CFR, Part 206, Subpart M), but a FEMA (1990) handbook, *Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments*, can serve as an effective guide to the process of planning and plan review (see sidebar on page 60). More recently, however, FEMA has been reshaping its relationship with state emergency management and mitigation agencies through clarifying its own expectations of state and local mitigation efforts, which emphasize the implementation of ongoing mitigation planning programs.

Structural approaches to hazard mitigation can include the building of seawalls and revetments, levees, seismic retrofitting, landslide barriers, and other measures designed to make the built environment more resistant to the onslaught of natural forces. There is a temptation for decision makers to rely on such approaches and to avoid the more difficult options of restricting development in hazardous areas, but such a one-sided attack on the problem suffers from two major deficiencies: first, that catastrophic damage can

Model and Actual Plans and Guides for Local Hazard Mitigation

For full citation information, see Appendix A. Also note that each state has a state-level mitigation plan that all local planners in that state can request from their state emergency management office.

- California Department of Forestry and Fire Protection, *California's I-Zone: Urban/Wildland Fire Prevention & Mitigation*
- California Seismic Safety Commission, *California at Risk: Steps to Earthquake Safety for Local Governments*
- Federal Emergency Management Agency, *Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments*
- Florida Department of Community Affairs, *The Local Mitigation Strategy: A Guidebook for Florida Cities and Counties; Workbook in Local Mitigation Strategy Development; Model Local Government Disaster Mitigation and Redevelopment Plan and Model Local Redevelopment Regulations*
- Hilton Head Island, South Carolina, *Post-Disaster Recovery and Mitigation Plan*
- Long Island Regional Planning Board, *Hurricane Damage Mitigation Plan for the South Shore—Nassau and Suffolk Counties, N.Y.*
- Massachusetts Department of Environmental Management, *Flood Hazard Mitigation Planning: A Community Guide*
- Nags Head, North Carolina, *Hurricane and Storm Mitigation and Reconstruction Plan*
- Pinellas County, Florida, *Post-Disaster Redevelopment Guide for Pinellas County*
- South Florida Regional Planning Council, *Post-Disaster Redevelopment Planning: Model Plan for Three Florida Scenarios*
- Tampa Bay Regional Planning Council, *Tampa Bay Region Hurricane Recovery Planning Project, Volume I—Phases I and II Regional Recovery Planning Guide*

Primary Steps for Hazard Mitigation Planning

Implementing regulations for Stafford Act mitigation planning list four primary components of a state hazard mitigation plan that are also outlined in Section 409 of the Stafford Act:

- An evaluation of the natural hazards in the designated area
- A description and analysis of the state and local hazard management policies, programs, and capabilities to mitigate the hazards in the area
- Hazard mitigation goals and objectives and proposed strategies, programs, and actions to reduce or avoid long-term vulnerability to hazards
- A method of implementing, monitoring, evaluating, and updating the mitigation plan. Such evaluation is to occur at least on an annual basis to ensure that implementation occurs as planned, and to ensure that the plan remains current.

Source: 44 CFR Part 206, Subpart M

exceed the design capabilities of cost-effective engineering solutions (Petak and Atkisson 1982), causing additional damage; second, that the avoidance of more difficult land-use decisions produces a false sense of security that allows more development in hazardous areas than might otherwise have occurred (Burby and French et al. 1985). Nonstructural approaches may include stricter building codes and improved enforcement, the acquisition of vulnerable properties, zoning and subdivision regulations aimed at minimizing or prohibiting undesirable land uses, setbacks, floodplain regulations, and relocation programs.

Implementation of the chosen strategies must then depend on the priorities established in the mitigation plan. Where do limited funds get spent first? Regulatory solutions (e.g., zoning) are obviously less costly than alternatives that involve direct public expenditures, but, with the exception of nonconforming uses substantially damaged by a disaster, do not affect existing development. Retrofitting costs money, but a community can become more adept at identifying funding sources to assist in these objectives and in developing incentives for property owners so that they are more palatable politically. Because most mitigation money is available after a declared disaster, communities must also build into their mitigation plans targets of opportunity, in effect shifting their priorities to fit the resources available at any given time. That is so commonly the circumstance that planners would be well advised to assume that such opportunism is a necessary element of a good mitigation plan. Part of the essence of good post-disaster planning is preparation to seize the moment. The best way to marshal the resources to do so is to have a ready set of priorities.

Finally, planners should develop criteria for implementing those priorities. Risk assessment is a critical factor in establishing those criteria because considerations related to protection of population (including density) and critical facilities will inevitably drive these priorities. Criteria are the workhorses of day-to-day plan implementation. At some point, for example, planners and other local officials must decide, with limited resources, which flooded house is bought and/or relocated from a willing seller, and which one must wait. These criteria may include a variety of very detailed factors, such as repetitive loss history, elevation within the floodplain, the condition of the property, the percentage of the surrounding subdivision or neighborhood that either has been relocated or remains intact, and the cost of the transaction. Many communities have developed scoring systems for rating the relative priority of various properties for acquisition or other mitigation strategies. In an area vulnerable to high-wind damage, for instance, which utilities should be undergrounded first, and how soon? Which local roads and bridges should be elevated or seismically retrofitted, and how soon? Which culverts most need to be expanded to facilitate the flow of flood waters? The answers to these questions are as varied as the communities themselves and involve as many possibilities as the items listed in Chapter 5.

From this discussion, it should be apparent that hazard mitigation is an implicit function of all other objectives of the plan for post-disaster recovery and reconstruction. Nonetheless, mitigation needs to be highlighted in its own right in the plan in order to achieve the visibility and priority it deserves. As a policy objective, mitigation should be seen as posing two distinct sets of opportunities that deserve distinct treatment—those pursued during the pre-disaster period and programmed into local government activities and budgets on an ongoing basis, and those created as an immediate result of a natural disaster and which must be acted upon in a timely manner during the recovery and long-term reconstruction periods. There are two essential reasons why these sets of opportunities are different. First,

the post-disaster period, especially if the local government has planned effectively for this eventuality, is one in which additional outside resources become available that would not otherwise exist. Second, the damage caused by the disaster and the consequent need to rebuild produce an atmosphere of heightened urgency in decisions concerning when, where, and how to rebuild. In other words, there is no substitute for a good plan in these circumstances.

Pre-disaster Mitigation

Despite the emphasis placed in this report on preparing to seize opportunities for hazard mitigation that arise in the aftermath of a disaster, nothing could make less sense in the context of post-disaster planning than to wait for such opportunities before doing anything. Hazard mitigation works best as a policy objective of local planning when it is so completely integrated into the comprehensive plan that it becomes a normal assumption behind all daily planning activities. There is far more political and institutional momentum in the post-disaster period behind a policy objective that is already in place and being actively pursued than in one that is suddenly activated from scratch, no matter how well the community planned for its contingency.

Any doubts on that point ought to be resolved by the case study of Arnold, Missouri, which appears in Chapter 8. That city's existing plans, part of its 1991 floodplain management plan, called for the establishment of a greenway along the Mississippi and Meramec rivers through a program of gradual buyouts of floodplain properties. When the 1993 floods arrived unexpectedly soon and with unexpected intensity, the city's pre-existing commitment to this objective made it easier to accelerate the whole process. This maxim need not be limited to land acquisitions; the same principle applies to other mitigation measures like elevation, floodproofing, seismic retrofitting, and various wildfire mitigation techniques.

An excellent example of an ongoing commitment to a major hazard mitigation challenge is the Los Angeles program for seismic retrofitting of a large stock of unreinforced masonry buildings (URMs), based on the earthquake hazard reduction ordinance the city passed in 1981. When it began, Los Angeles required almost 8,000 URM owners over several years either to improve their buildings, vacate them, or face demolition. Despite the massive damage of the 1994 Northridge earthquake, matters could have been much worse. By 1996, one-third of the URMs were vacated or demolished, and 95 percent of those remaining were in compliance (FEMA 1997c).

Stricter building and zoning codes for future development, whether stemming from a planning process related to natural hazards and post-disaster recovery or not, also play a role in achieving the policy objective of pre-disaster hazard mitigation. The severe housing damage following Hurricane Andrew that stemmed from admittedly uneven compliance with the Southern Florida Building Code served, if anything, to highlight the value of the code where it had been observed. It is sometimes easy to lose perspective on just how much we have learned about effective hazard mitigation techniques regardless of the specific disasters involved. No American city, for example, is even remotely likely today to suffer the same type of massive housing and infrastructure damage that occurred in San Francisco in the 1907 earthquake. The reason is simply that so much has been done to secure newer buildings and structures over time even though the city and region have grown significantly since then.

The objective of a pre-disaster mitigation program is to identify vulnerable buildings and infrastructure and to program the needed improvements into governmental budget priorities, as well as to persuade private property

Hazard mitigation works best as a policy objective of local planning when it is so completely integrated into the comprehensive plan that it becomes a normal assumption behind all daily planning activities.



Marya Morris

This home in Lewes, Delaware, was elevated to raise it above the base flood level in a coastal high hazard area.

owners to undertake such commitments themselves to the extent possible. To return to the Arnold, Missouri, example, it is far easier to convince outside funding sources to assist with such efforts if it is clear that the local government, and ideally its business sector and citizens as well, already are taking the issue seriously.

Seizing Post-Disaster Opportunities

It should be obvious by now that pre-disaster and post-disaster mitigation should be two parts of a seamless whole in a sound plan for post-disaster recovery and reconstruction. The only difference, although it is often a major difference, is one of scale, of accelerating the pace with which existing mitigation plans are implemented, as a result of the influx of outside assistance. What is important about planning for post-disaster hazard mitigation is that the additional resources that facilitate local hazard mitigation in the aftermath of a disaster do not materialize by accident. Local governments manage to secure such resources in large part because they have planned to do so.

That does not mean that they know when those plans will be put into effect. Arnold took advantage of the post-disaster elements of its 1991 floodplain management plan far earlier than anyone had expected, and on a grander scale than it had expected. Los Angeles was forced to activate its plan for post-disaster recovery and reconstruction during the Northridge earthquake almost as fast as it had adopted it. Disaster could strike even in the midst of the planning process. One never knows, but initiating the process now usually ensures more success than waiting.

Planners and city officials also find themselves in a position to accelerate mitigation in the post-disaster period because a disaster captures people's attention for such matters like nothing else. This attention span can be very short, however, unless local officials are able to focus it quickly and point to existing plans to address the problem because there is little time in the recovery period for developing plans from scratch. Many property owners are facing the need to rebuild or to repair damaged buildings, and while this

circumstance generally leads to pressure to allow them to rebuild the same structures in the same places, this need not always be the outcome—certainly not where the local government is prepared with some alternatives and has identified in advance some resources with which to implement them. Specific details of the issue of using disaster assistance effectively is addressed later in this chapter.

One noticeable result, for example, of the 1993 Midwest floods was a growing public willingness to consider such alternatives, leading to the complete relocation of towns like Valmeyer, Illinois, and Pattonsburg, Missouri, and significant alterations to local development patterns in many others. The targets of opportunity are not just those physical structures that are most vulnerable to natural hazards, but the public attitudes toward those opportunities and the prospect of mobilizing public opinion behind the idea of implementing a new vision. Ideally, that new vision will have been considered in the process of developing a plan for post-disaster recovery and reconstruction, but even where that is not the case, it may still be possible to act quickly. Neither Valmeyer nor Pattonsburg had such a plan prior to the 1993 floods, but, with outside assistance, their civic leaders, particularly their mayors, were able to rally local public opinion. Their job may have been made easier by the small scale of their communities. In larger communities, the pre-disaster preparation of a plan for post-disaster recovery may be more essential to success.

The targets of opportunity are not just those physical structures that are most vulnerable to natural hazards, but the public attitudes toward those opportunities and the prospect of mobilizing public opinion behind the idea of implementing a new vision.

Because only very small communities will likely ever undertake wholesale relocation, planners need to focus on those less drastic but nonetheless significant opportunities that are more likely to present themselves. These opportunities may include rezoning hazard-prone areas to lower densities, designating areas where acquisition of property would be most effective and establishing priorities to guide those purchases, designating target areas for various kinds of retrofitting, and revisiting subdivision controls for hazard-prone areas (Morris 1997). In the aftermath of disaster, planners may also discover unique opportunities to reassess the effectiveness, extent, and policy basis of existing hazard mitigation programs.

The National Flood Insurance Program (NFIP)

By far the most significant and far-reaching federal legislation affecting local land-use planning is NFIP. It remains the one program deliberately designed to have some direct federal policy-making impact on local land-use planning related to disasters. It thus merits some special discussion related to local hazard mitigation policy objectives because of its unavoidable influence on local decisions concerning those objectives.

Put simply, NFIP has steadily become more specific in encouraging the type of local planning and land-use regulation that will yield results. That is not always readily apparent because so much of the program has relied from the beginning on incentives rather than direct mandates, although there are more than a few of the latter once a community is in the program. Participation in the program is voluntary; otherwise, its effectiveness relies on the willingness and desire of property owners to buy the insurance, whose availability depends on the compliance of their local government with the terms of the program. Those terms include the adoption and enforcement of a floodplain management ordinance, which necessarily imposes requirements for construction and post-disaster reconstruction within the regulatory floodplain.

Beyond the actual requirements of NFIP, FEMA encourages communities to undertake floodplain management programs that consider a number of factors that, it is hoped, will provide for a more comprehensive approach than the simple adoption of mandatory regulations. These are delineated in

the Code of Federal Regulations (44 CFR, Section 60.22(c)). (The language of that section appears in this report in Chapter 7.) Planners may perceive in these considerations a relationship to floodplain management regulations that is similar to that between a comprehensive plan and a zoning ordinance. Many states not only require a comprehensive plan as a step preliminary to the adoption of zoning, but also require consistency between the two documents. In some cases, rezoning can be overturned legally on the basis of inconsistency. In any event, a community that wants to address flood hazards seriously, rather than merely to comply with NFIP regulations, would do well to examine the list of floodplain management elements suggested in NFIP regulations as a starting point for an effective, well-planned floodplain management program. Planners in states that already require some type of natural hazards element in local comprehensive plans may already be accustomed to perceiving the issue in these terms. Planners should also encourage their communities not to limit their focus to the 100-year floodplain as if some magical force prohibited larger floods. In fact, according to FEMA, nearly 35 percent of flood insurance claims go to victims outside the 100-year floodplain (TBRPC/Hillsborough County 1995).

Planners should also encourage their communities not to limit their focus to the 100-year floodplain as if some magical force prohibited larger floods. In fact, according to FEMA, nearly 35 percent of flood insurance claims go to victims outside the 100-year floodplain.

It is unlikely that NFIP will move away from its philosophy of essentially relying on voluntary participation, but it is likely that the strength of both its incentives and disincentives will grow with each new reform. This conclusion is apparent from the evolution of the program. At its inception in 1968, with the passage of the National Flood Insurance Act (NFIA), the intent was to make federally subsidized insurance available to owners of homes and businesses subjected to flood hazards. To ensure some effort by local governments to restrict losses, insurance was available only in those communities that adopted a floodplain management ordinance in compliance with program requirements. As of October 1998, 19,302 communities (out of nearly 22,000 identified as having flood hazards) were participating in NFIP.

Originally, however, little in the program served to differentiate the actual level of risk. Premiums were based on various flood hazard zones but did not reflect the level or quality of effort of individual communities in reducing flood hazards. The Community Rating System (CRS), also discussed in Chapter 5 of this report, was born out of a desire to incorporate in federal flood insurance rates some reflection of this quality of effort. The point of CRS is to offer incentives, in the form of premium reductions to policy holders, for communities to perform a series of point-garnering activities that are assumed to strengthen local floodplain management. As of October 1998, 894 communities with flood problems were participating in CRS, and they represent 66 percent of the NFIP policy base. With the exception of the Flood Mitigation Assistance Program described in the following paragraph, the CRS is the closest any federal hazards program has ever come to spelling out what the federal government would like to see in a comprehensive hazards management plan at the local level. Under the floodplain management planning category, communities can receive points for:

- organizing and preparing the plan;
- involving the public;
- coordinating with other agencies;
- assessing the hazard;
- assessing the problem;
- setting goals;
- reviewing possible activities;

- drafting an action plan;
- adopting the plan; and
- implementing, evaluating, and revising the plan.

By 1994, following the great Midwest floods of 1993, flood program reform was again in the air and resulted in the passage of the National Flood Insurance Reform Act, which amends the original 1968 act. CRS remains voluntary, providing incentives in the form of credits on policyholders' flood insurance premium rates for communities that undertake the recommended activities. The new law also replaced two previous programs that provided funds for buying and removing flooded or erosion-threatened structures with a new Flood Mitigation Assistance Program that is to provide grants to state and local governments for planning and executing activities to reduce flood risks before disaster strikes. Eligibility for the program requires the adoption of a flood-risk mitigation plan approved by FEMA, whose requirements are compatible with those of CRS and Section 409 of the Stafford Act. Finally, to increase program participation by property owners, the 1994 amendments:

- direct the federal agencies that regulate financial institutions to mandate that the institutions abide by rules which required that loans the institution made, increased, extended, renewed, or purchased from another lender were to include flood insurance if the property securing the loan was in a floodplain;
- require that federal lenders be given that same mandate;
- require lenders that escrow taxes, insurance premiums, and other fees to also escrow payments for flood insurance as a means of discouraging homeowners from dropping the insurance after the first year or after receiving flood damage payments (a common problem); and
- require lenders to notify FEMA of any change in the servicer of a loan covered by flood insurance, as when an original lender resells the loan to a secondary mortgage institution.

These measures represent the latest tightening of the federal screw within a voluntary, incentive-based context in order to ensure that federal disaster aid is seen less as an entitlement and more as a helping hand in a meaningful intergovernmental partnership to reduce hazard risks.

CONNECTING THE DOTS

Although a plan for post-disaster recovery and reconstruction can be conceived and prepared as a stand-alone document, it should ideally be part of a community's comprehensive plan and therefore be integrally linked with all other elements of the city's plans. Disasters have the potential to disrupt so many aspects of normal activity in a community that there are few aspects of a city's operations that will remain totally unaffected. The point of this section is to discuss how and why those linkages may occur. The policy objective is to ensure the integration of disaster-related planning into the considerations that drive other plans and plan elements.

Linkages with Other Comprehensive Plan Elements

Consider just two recent major disasters—Hurricane Andrew and the Northridge Earthquake—and their impact on a variety of normal civil government functions, all of which are typically the subject of some element of a local comprehensive plan.

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Particularly important are the linkages between a natural hazards and post-disaster element and the implementation element of a comprehensive plan. Pre-disaster mitigation plans need clear goals and a time frame to be achieved and in order to avoid gathering dust on a shelf. It is all too easy for mitigation objectives to remain unfunded for years.

- Telecommunications were disrupted where telephone lines were down.
- Transportation was disrupted by damaged bridges, fallen trees, and other obstacles.
- Utility service was unavailable where power lines were down.
- Education was interrupted at all levels not only because of the above problems but also because school buildings were damaged, roofs had collapsed, and schools were used as temporary shelters.
- Economic development agencies had suddenly inherited the huge job of helping businesses reestablish themselves in the face of a weakened economy, structural damage, loss of customer access, cleanup priorities, inability of employees to commute to work, and related nightmares.
- Thousands of residents needed emergency housing, and others faced the task of arranging for costly repairs.
- Environmental damage was substantial, particularly where fragile ecosystems were harmed or spills of hazardous waste occurred.

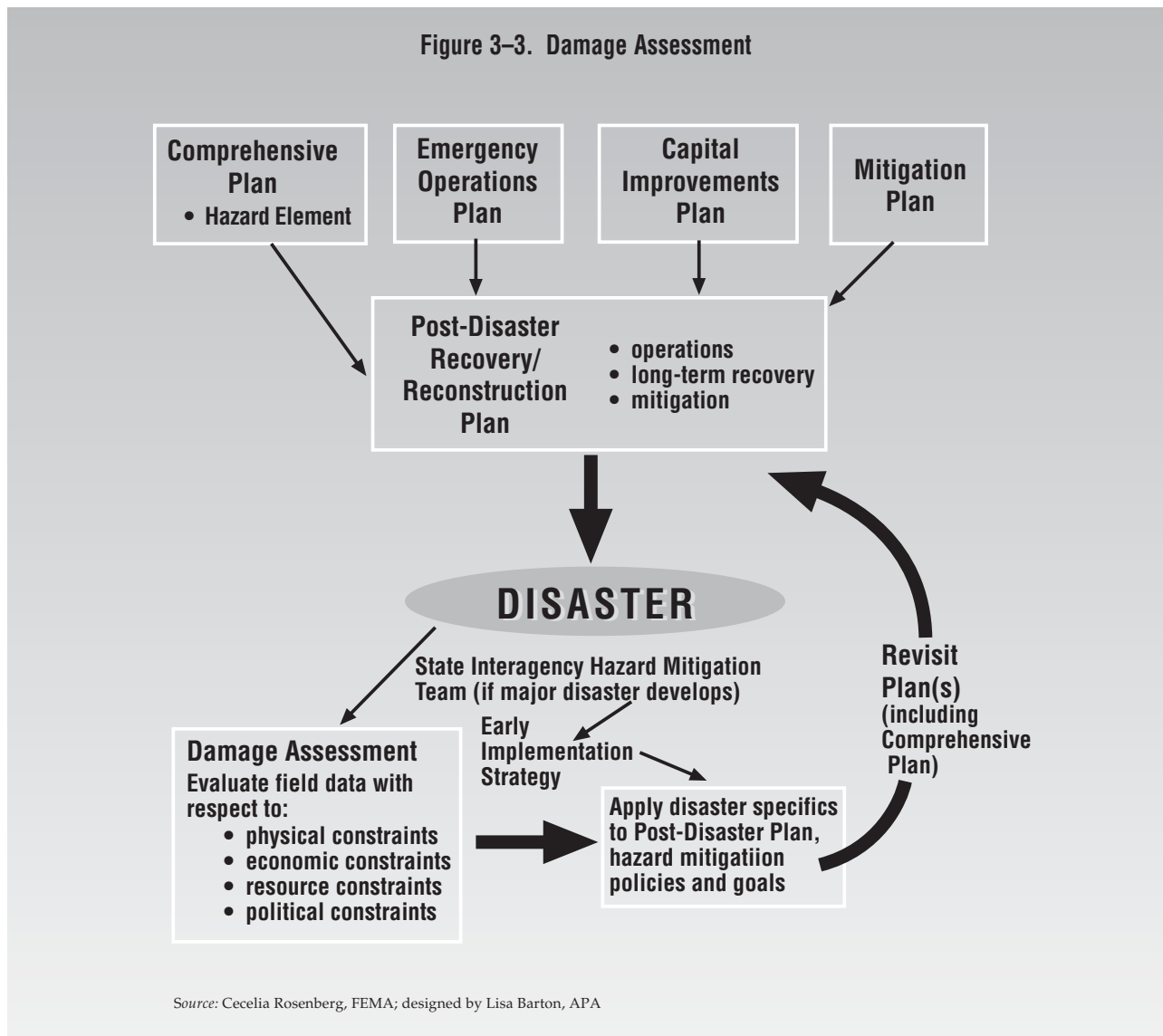
Clearly, the list of local comprehensive plan elements called into question can be even longer. Land-use elements, dealing with the community's plans for zoning changes and subdivision regulations, among other issues, are an obvious additional point of linkage for post-disaster considerations because many communities may find a need to revisit such regulations based on lessons learned from the disaster. (See Figure 3-3.) Public safety, capital improvements, and other elements may also be examined for their potential role in addressing mitigation and disaster planning.

Particularly important are the linkages between a natural hazards and post-disaster element and the implementation element of a comprehensive plan. Pre-disaster mitigation plans need clear goals and a time frame to be achieved and in order to avoid gathering dust on a shelf. It is all too easy for mitigation objectives to remain unfunded for years. Although post-disaster recovery and reconstruction plans may seem to be self-activating once disaster strikes, experience indicates that the unpredictable timing of disasters can allow them to be forgotten by the time the event occurs. It is essential that oversight and agency responsibilities be clearly assigned. The designation of a post-disaster recovery task force, as discussed above, is one obvious way to accomplish this purpose.

The principal point is simply that post-disaster issues must be considered as these other plan elements are prepared, and cross-references within them to the post-disaster element can then make the plan an effective instrument for taking cognizance of both the problems and opportunities for improvement that the disaster itself may engender. Des Moines, for instance, was forced in the aftermath of the 1993 floods to reconsider the vulnerability of its single water treatment plant in the downtown area and take steps to plan for some alternatives. Although no one anticipated the duration or extent of those floods, prior consideration of this issue might have given rise to other options much earlier.

Linkages with Other Plans

The comprehensive plan, while clearly the most important set of linkages and the ideal repository for the plan for post-disaster recovery and reconstruction itself (as an element), is not the only linkage that matters. The opportunities for integrating disaster planning awareness into local plans



and their implementation extends much further. Many special plans developed by local governments also deserve such attention.

Neighborhood plans, for instance, allow an ideal opportunity to sharpen the focus of post-disaster planning. Neighborhoods in hazard-prone areas, especially if they are developed with a high level of citizen participation, can serve well to raise citizen awareness of the need for preparedness and mitigation and of possibilities for more sustainable methods of rebuilding (such as improved energy efficiency in more disaster-resistant structures) in the aftermath of a disaster. Could better stormwater detention systems that resulted in the construction of swales or that took better advantage of natural runoff patterns ease a neighborhood flooding problem? Might fire-resistant landscaping requirements for a subdivision or homeowners association help avert disaster? What access patterns could be changed to benefit residents and improve public safety? Under what conditions should treasured but vulnerable historic buildings and homes be demolished? Linking the post-disaster element with the development of neighborhood plans presents an opportunity to nail down details of post-disaster reconstruction and mitigation that might otherwise escape notice in the larger scheme of things.

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Resources that may not be available on a routine basis for certain improvements may become available from various disaster relief sources, particularly where careful planning has allowed the community to identify certain needs in advance, saving critical time in the aftermath of the disaster.

Finally, there is the most important link of all to a plan independent of the local comprehensive plan, in no small part because it brings together two groups of professionals who need to collaborate more than has traditionally been the case: planners and emergency managers. The latter develop their own emergency operations plans, which are in the vast majority of cases focused almost exclusively on immediate response and recovery functions following a disaster.

Area and corridor plans likewise present special opportunities to examine specific issues, the latter particularly in the area of transportation. Downtown or business district plans for areas with significant natural hazards can address the questions of how business activity will be restored in the aftermath of a disaster, what sort of economic redevelopment may be necessary, and which resources will be available to make it all happen. Narrowly focused infrastructure considerations, such as planning for the undergrounding of utility lines in a waterfront business district, can undergo detailed scrutiny in such plans.

One special area that absolutely needs linkage consideration is capital improvements programming. Because such programming involves the scheduling of public improvements over a multiyear period (typically five years), it presents a recurring opportunity to consider and include those improvements needed to make the community more disaster resistant. The list of potential improvements that fall into this category includes nearly every item of public expenditure mentioned in this report, from road resurfacing and the retrofitting of vital infrastructure for wind or seismic resistance, to the creation of emergency management shelters and the seismic retrofitting of schools and community buildings. As important as the improvements themselves is the provision for financing them, the subject of later chapters in this report.

Because of the unpredictability of disaster-related reconstruction costs, however, it is also important to recognize the wish-list aspect of capital improvements planning. Resources that may not be available on a routine basis for certain improvements may become available from various disaster relief sources, particularly where careful planning has allowed the community to identify certain needs in advance, saving critical time in the aftermath of the disaster. This is particularly true with regard to assistance under Section 406 of the Stafford Act (42 U.S.C., Section 5172), which deals with the federal cost share for the repair, restoration, or replacement of damaged facilities. The act permits some flexibility by allowing a local government to receive 90 percent of the federal cost share if it chooses not to repair or replace a damaged facility but to channel that money into mitigation for other facilities instead. Incorporating mitigation-related concerns into capital improvements planning thus eases the path to quickly identifying the community's unmet needs when it counts.

Finally, there is the most important link of all to a plan independent of the local comprehensive plan, in no small part because it brings together two groups of professionals who need to collaborate more than has traditionally been the case: planners and emergency managers. The latter develop their own emergency operations plans, which are in the vast majority of cases focused almost exclusively on immediate response and recovery functions following a disaster. These are, of course, extremely important, but the opportunity has generally been missed for discovering the synergies involved in linking long-term post-disaster recovery and reconstruction planning with emergency management concerns. The two professional communities have much to say to each other, for there is no clean division in time between the response period that begins with the onset of disaster and the initiation of long-term recovery and rebuilding functions.

To cite one example, planners and emergency managers at the same table might agree that a new subdivision of any type with no basements—whether because it consisted of manufactured housing or because, as is often the case along the Gulf Coast, the climate does not permit such construction—might be better off with a required storm shelter to prevent deaths and injuries from tornadoes, hurricanes, and other violent weather. In the absence of collaboration, however, such concerns may never be voiced

during the development process, and the concept of a later retrofit seldom acquires much urgency. In the end, a form of mitigation that might have been incorporated into the site plan at only modest additional expense never happens. After disaster strikes, the inevitable question is Why?

Similar examples of the value of cross-breeding emergency management and comprehensive planning can be found with regard to virtually every disaster scenario imaginable. Many of these have to do with public safety functions during the emergency period that nonetheless have some repercussions for the long-term rebuilding process, such as the reopening of blocked roads in flooded areas or emergency access to fire-prone hillside developments.

Moreover, the discussion between these two groups, particularly if augmented by environmental and sustainable development perspectives, could open up new opportunities and approaches for post-disaster redevelopment. For instance, to the extent that centralized power sources are vulnerable to certain kinds of disruption, creative efforts to introduce renewable power sources that can be generated on site might open the door to further explorations of new possibilities in local energy planning. In a severe northern ice storm, for example, buildings with their own solar power and heating sources can maintain operations where those dependent on downed power lines cannot. Might this not be a potential consideration relative to shelter sites? Once in place, might it not serve as a provocative example for the rest of the community? Collaborative thinking by planners and emergency managers concerning these eventualities can open the door to some exciting new ideas for rebuilding more disaster-resistant communities.

Linkage with Land-Use Regulations

State laws vary widely concerning the required degree of consistency, if any, between local land-use regulations, particularly zoning, and the comprehensive plan (Dennison 1996). Some state courts require strict consistency and view the comprehensive plan as the controlling document to which the local zoning ordinance must adhere. In others, zoning may occur with no comprehensive plan whatsoever, and sometimes in the view of state courts serves as the master plan itself. In the absence of any consistency in state rules regarding consistency, it is impossible here to discuss in depth the legal relationship of the plan or element for post-disaster recovery and reconstruction to land-use regulations.

As a practical matter, however, a community clearly advances its agenda for post-disaster recovery and reconstruction by using the development of such a plan to review the logic of its existing land-use regulations and to revise them in accordance with its own stated goals as a byproduct of that planning process. These are inevitably very hazard-specific. For instance, coastal erosion is a recurring concern in communities facing hurricane hazards. Nags Head, North Carolina, used its plan to address this problem by requiring future subdivisions to have ocean-to-road linear orientations, an approach of little relevance to most other types of hazards. On the other hand, vegetation, slope ratios, and soil stability would be relevant regulatory considerations in wildfire and landslide hazard areas.

APA recently published a PAS Report (Morris 1997) dealing with subdivision controls in flood-hazard areas. Various earlier PAS Reports have dealt with land-use regulatory and design issues concerning other types of hazard-prone areas, such as steep slopes and earthquake fault zones. Mostly, however, these deal with the design and zoning for new subdivisions and other developments rather than those affected by disaster and needing to undergo reconstruction. The reconstruction situation can be

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considerably more daunting because of existing lot lines and, far more often than not, a crazy-quilt pattern of damaged and undamaged structures within the same area. For these areas, rezoning considerations, especially with regard to lot size and configuration, or floor-area ratios and impervious surface coverage, can be a treacherous enterprise, but it is certainly made easier by some forethought about potential alternatives in a plan devised prior to the emergency.

USING DISASTER ASSISTANCE EFFECTIVELY

The first step in effectively using disaster assistance, says consultant Clancy Philipsborn (1997), principal of the Mitigation Assistance Corporation of Boulder, Colorado, is to learn not to focus on the disaster alone. A community's narrow focus on simply gaining access to the limited pools of disaster assistance money available from FEMA leads to a cramped vision of the its options and keeps it from getting a handle on the bigger picture. In other words, planning for post-disaster recovery and reconstruction needs to be well integrated into the community's comprehensive plan and stitched into its larger vision of its own future. Not only does this open up much larger options for attracting outside resources to aid in post-disaster recovery and reconstruction, but it also helps the community itself to identify more creative solutions to a range of problems exposed by the damage wrought by a disaster. Furthermore, it provides an opportunity to identify a range of resources to assist in dealing with ongoing or pre-disaster mitigation issues. For instance, many small Midwest communities had long-running economic difficulties that may have been exacerbated, but certainly were not caused by, the 1993 floods. For those communities that latched onto a multiobjective approach, recognizing those larger problems and seizing opportunities to address them through the rebuilding process was the key to creative planning for economic renewal.

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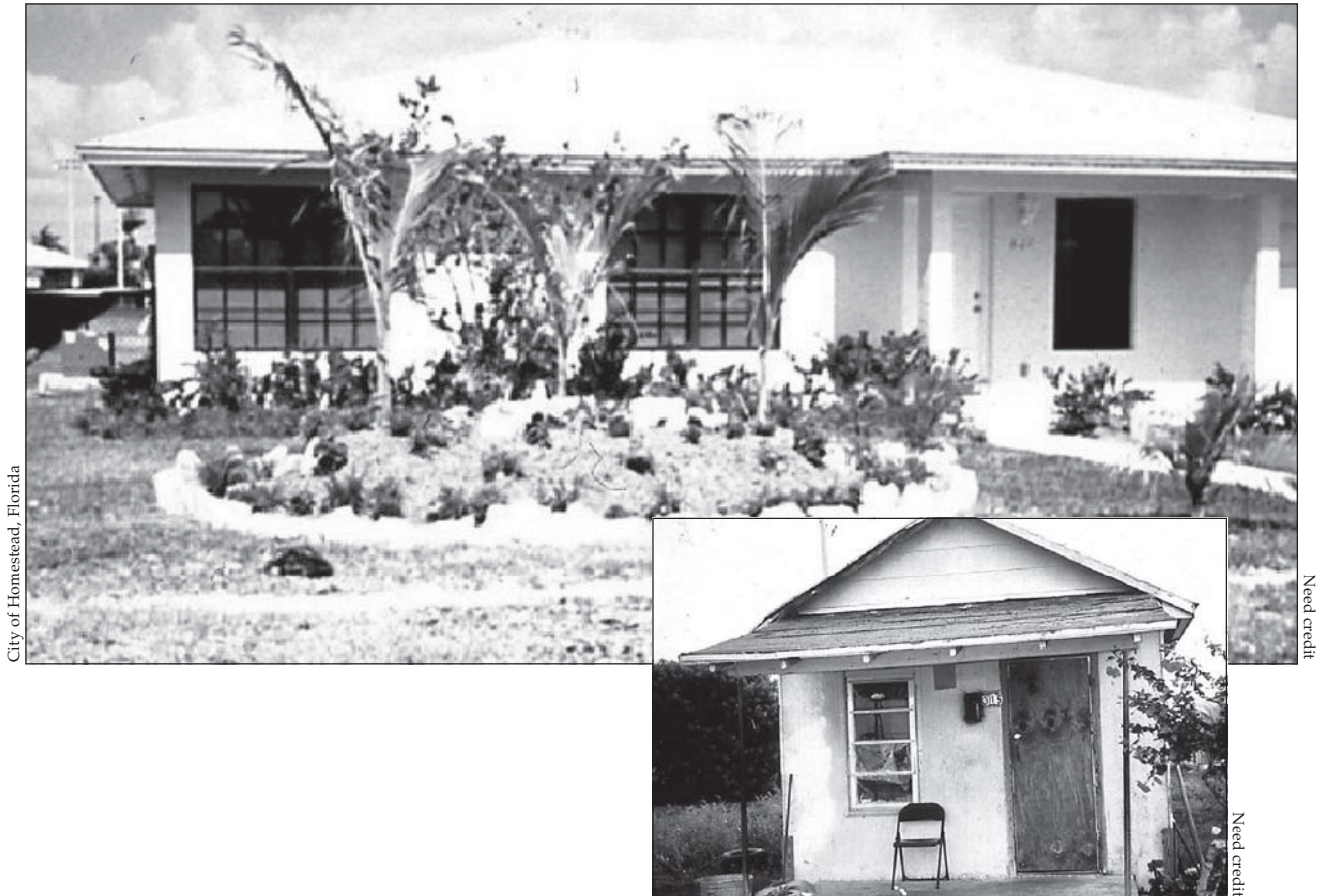
Among the examples that emerged from the Midwest floods is that of Valmeyer, Illinois. Although the total relocation of a town is an exceptionally rare outcome, Mayor Dennis Knobloch showed unexpected opportunistic zeal when, after initial skepticism, he sought the help of an outside design team organized by DOE to bring sustainable design principles to the relocation process. Knobloch acquired his enthusiasm while attending a conference on sustainable redevelopment underwritten by DOE, with support from the Johnson Foundation, at the Wingspread Conference Center in Racine, Wisconsin, in January 1994. The regional planning agency had already laid out the new town site, and time did not allow for reconsideration of its conventional suburban-style street layout. Valmeyer, however, still derived substantial benefits in other ways, particularly by incorporating superior energy efficiency into its new buildings, using incentives provided by the Illinois Department of Energy and Natural Resources.

Pattonburg, Missouri, because it did not yet have a new town site platted by the time it connected with DOE's design team, was able to use such help more extensively in pursuing a more neotraditional design and opening more questions to public discussion in its citizen participation process. Mayor David Warford latched onto the idea of sustainable redevelopment by attending a workshop in Valmeyer. Pattonburg was then able to marshal resources from the Division of Energy in the Missouri Department of Natural Resources, in addition to FEMA, DOE, and the Economic Development Administration (Skinner and Becker 1995).

A number of other communities, including Darlington, Wisconsin, and Arnold, Missouri, were able to act on their own dreams of connecting their river corridors to larger existing greenways and trails, using money from the special \$130 million supplemental appropriation for the buyout pro-

gram designated by Congress for use in the Midwest (Design Center for American Urban Landscape 1994).

Homestead, Florida, which was forced by Hurricane Andrew to undertake extensive rehabilitation of its downtown and nearby residential areas, constructed a package of improvements under a newly created community redevelopment agency called Homestead Economic and Rebuilding Organization (HERO). Its five-year plan reveals heavy reliance on a combination of state and federal resources including various grant programs of the



City of Homestead, Florida

Need credit

Need credit

federal Economic Development Administration and grants for road improvements from the Florida Department of Transportation, in addition to the use of Community Development Block Grants (CDBG) and Housing Opportunities Made Equal (HOME) funds from the U.S. Department of Housing and Urban Development for residential redevelopment (Enterprise/Homestead Planning/Action Team and City of Homestead 1993).

FEMA is simply not the only game in town when it comes to applying for disaster assistance. Many agencies and institutions that may have no direct connection to disaster management may be viable sources of funding for communities that can tie other development objectives to their plans for post-disaster recovery and reconstruction. (Appendix C provides a directory of federal programs providing various types of disaster assistance.) This allows a community to assemble a better array of funding to achieve its own longstanding objectives. Moreover, a more substantial local effort, including the extra effort that goes into identifying and pursuing such funds, will go a long way in impressing FEMA

Code enforcement and crime had been problems in this Homestead, Florida, neighborhood (below, right). After Hurricane Andrew flattened the area, the Homestead Economic Redevelopment Organization acquired and cleared the property and constructed 18 single-family houses (above), which were sold to first-time buyers.

officials with the level and quality of the local contribution to the post-disaster effort, potentially bumping the creative community up the priority list in the competition for disaster funds. The Nags Head, North Carolina, *Hurricane and Storm Mitigation and Reconstruction Plan* (1988) contains a provision for retaining an assistance facilitator-consultant who would be responsible for:

- determining the types of assistance available to the town and the type of assistance most needed;
- assisting in the coordination of federal disaster recovery effort;
- coordinating federal and state programs of assistance;
- informing the community of types of assistance programs available; and
- recommending to the recovery task force and board of commissioners programs that are available to the town and then to act as facilitator in securing those programs.

It is important to consider the community's contribution of staff time and energy in addition to any specific budgetary allocation it makes to match federal and state grants. Many communities, Philipsborn says, fail to account for this "soft match" of resources for disaster assistance. For some projects, that staff time may be quite substantial.

Boone: A Case Study

Boone, North Carolina, a town with recurrent flood problems, provides an example of a community with a particularly thoughtful and flexible plan for using disaster-related assistance to achieve several outcomes and to use a "soft match" to generate more resources. Part of the town's mitigation program entails a three-phase project within one neighborhood. Phase One of the project is the acquisition and relocation of 15 houses on 17 lots, all of which are located within the floodway and 12 feet below the base flood elevation. The town conducted appraisals and offered the building owners fair-market value. For those owners who wanted to retain their structures, relocation assistance was envisioned in lieu of purchase—but only if the cost of relocation was less expensive than outright purchase. To accomplish this effort, the town assembled a package of funding consisting of FEMA Hazard Mitigation Grant Program (HMGP) funds, state division of emergency management funding, HUD-state CDBG funds, and town resources.

In many communities, that might have been the whole story. Boone, however, is planning to eliminate the demolition and removal costs by bringing other priorities into play. It turned out to be more manageable for the town to plan to relocate the majority of acquired structures to a new low- and moderate-income housing development elsewhere within Boone (rather than allow the few interested owners to relocate the structures themselves). Owners who wanted to reoccupy their homes and meet the income eligibility requirements will be provided the highest priority to purchase within the development. In addition, several structures are being donated to Habitat for Humanity and to a women's domestic violence organization. The organizations taking possession of the structures will be responsible for their relocation, but the town has lined up additional low-interest funding that is available to help defray the costs should the organizations be interested. Finally, if a structure remains unmoved, it will be donated to the town fire department and burned for training purposes. Thus, a variety of housing and other community goals are being served by identifying stakeholders with an interest in the physical property.

Phase Two, which also was funded, involved the acquisition and relocation of 15 additional structures. The only difference is that these structures are in the floodplain, rather than the floodway. According to project manager Jim Byrne (1998), by December 1998, 24 of the total of 30 units acquired had been relocated and were to be rehabilitated to create low- and moderate-income housing. Philipsborn added that a "reuse plan has been developed for the area vacated by both Phase I and Phase II that incorporates open space, bicycle and pedestrian trails, and an open-air amphitheater."

Phase Three of this project is for the relocation of a 104-bed residential health care facility. Funding of this phase exceeds that of Phases One and Two together and required a different strategy. An HMGP application for Phase Three was submitted to the state in December 1997 and is pending approval when funds become available. The primary focus initially was to assist the health care facility to relocate its business to a flood-free location and to promote the reuse of the structure as a nonresidential daytime use. This would be considerably safer than the current use, which is a 24-hour residential care facility for individuals with disabilities. To date, the town has successfully supported the facility's application for an increase in the state-controlled number of beds. This provides the means for the business to operate profitably in a new location. Second, the town waived current policy by agreeing to extend water and sewer services to the proposed new site, which is beyond the town's current limits. Then, the town approved a request for rezoning of the existing building's site to improve the ability to attract a suitable nonresidential day use. According to Byrne, however, in the end, the nursing home operator was unable to make the move without selling the old building, so the application ultimately involved purchasing and demolishing the facility.

The options for preserving the newly created floodplain open space are equally diverse and the result of the emergence of other local priorities and interested parties. Of course, the final results will be contingent on many factors, not the least of which is 100 percent voluntary participation of the building owners to sell their properties and vacate the floodplain. Among the parties interested in the reuse of the floodplain property is the state department of transportation. They "owe" several acres of reconstructive wetlands to replace those destroyed elsewhere within the county during a construction project. This site meets their criteria, thus creating a situation where environmental regulatory priorities may enhance the funding sources for a hazard mitigation project. The state also has funding for a greenways program, and consideration is being given to using some of the land to fill a missing link of the town's existing trail system. Clearly, the greenway and wetlands project could be linked together. In addition, Appalachian State University is located in Boone, and it has an interest in obtaining more open space for use as recreation and/or parking. And, of course, both the town and the county are interested in using the space for similar purposes themselves.

A key element in the Boone story concerns the local match for federal disaster assistance, which can provide up to 75 percent of the cost of a project. Finding a variety of other funding sources can make the community's grant application look more attractive by reducing that federal match. In Boone's case, that federal percentage fell to just 63 percent, a very attractive proposition for agencies dispensing limited funds to competing local governments. Even more importantly, this is an attractive proposition for the state, which must prioritize and select projects to stretch the available money and provide matching funds.

The Essential Lesson

The essential lesson is that a community's ability to marshal disaster assistance and use it effectively does not depend solely on its ability to make a case for the need to rebuild the community. It depends instead on the community's ability to relate those reconstruction goals to larger plans it has developed for the community's overall future. Fitting disaster assistance aims into those larger aims allows officials to be more creative in thinking about the kinds of funds that may be appropriate to the situation. Those can include a variety of possibilities: rural economic development, housing, transportation, environmental protection, parks and recreation, urban redevelopment, and even health and sanitation.